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VETERINARY MEDICINE

APRIL 1942

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No. 4

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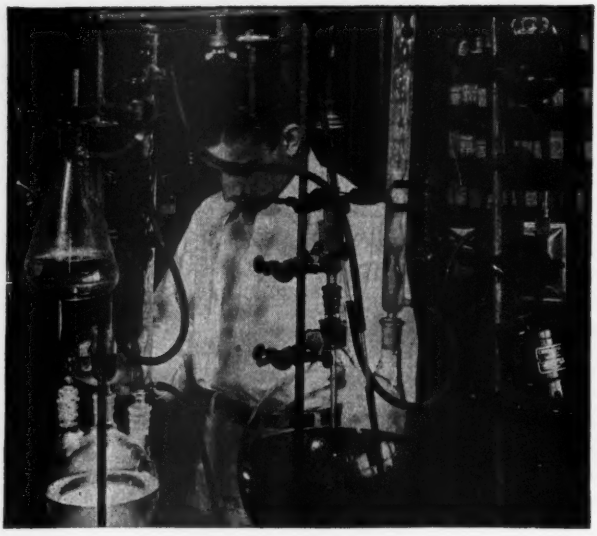

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VETERINARY MEDICINE

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Leading Publication in the Veterinary Field for More Than Thirty Years

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In England horse flesh for animal and human consumption may not be sold at the same shop. If horse flesh is sold other meats for human use may not be kept or sold on the same premises.

* * * *

Finding out where disease exists is a prerequisite to intelligent efforts to control it. Upon this basis, it must be said that, except for a few spectacular diseases, little such effort is being made by official bodies to control the livestock disease in this country.

* * * *

During World War I the Veterinary Corps of the Army inspected the almost unbelievable total of 1,779,848,620 pounds of meat and other animal food products, which cost the government more than 500 million dollars, or seven times as much as all the horses and mules purchased for the army—and not a dollar of this sum was paid, except upon the certification of a veterinary officer. When, in 1918, the army reached 4,000,000 men, its daily requirements for beef and pork alone numbered 10,000 cattle and 22,000 hogs!—*Veterinary Military History of the U. S.*

* * * **Buy Defense Stamps and Bonds**

A mighty good thought is to get acquainted with a veterinarian before you have any occasion to consult him professionally. Let him see your dogs while they are in excellent health because this will increase his interest when or if he is called to give treatments.—*The American Field.*

* * * *

The arts of zoötechnics and veterinary medicine developed simultaneously with civilization itself. The birth of the veterinary art actually preceded that of human medicine. Food is a primal requirement. Veterinary medicine, which sustains life, preceded human medicine, which preserves it.

* * * *

Meat to Britain makes the trip under a new refrigerating scheme. Shippers box the meat, then quick-freeze it, box and all. The boxes are then packed in the holds of ordinary cargo ships that have been insulated bottom and side with cartons of solidly frozen lard. More frozen lard is piled atop the frozen meat. Both products cross the ocean in good condition, despite the slow schedules necessitated by convoying.

* * * **Buy Defense Stamps and Bonds**

One of the chief duties of the Veterinary Corps of the Army is the inspection of food products.

Alfalfa meal varies from 2.4 to 200 parts per million in carotene content; therefore as a source of vitamin A some alfalfa meals are worth 83 times as much as others.

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Of the 502 alumni of the Division of Veterinary Medicine, Colorado State College, 57 are at present serving in the Army—nine are in the Veterinary Corps of the Regular Army and 48 are Reserve Officers on active duty. One hundred and fifty-five of the Colorado veterinary graduates are engaged in federal, state or municipal work.

Community Auctions and Disease Dissemination

Probably there is no single factor that is so largely responsible for the introduction of swine erysipelas and other diseases and their dissemination in Illinois as the sale auction. This conclusion is based on the examination of more than 40,000 specimens of diseased animals sent to us last year. Surely that affords a comprehensive survey of disease prevalence in this state.—*Robert Graham.*

The Long Haul for Dairy Profits

The fact that Milking Shorthorns are rugged cattle and stand severe climates, make the most of good rough feeds (where most of the milk comes from), produce on good average farm care 8,000 to 10,000 lbs. of 4% milk and a carcass at the end of their usefulness as milkers that sells at the top of the market, makes them ideal for farms. Steers, too, can be raised and profitably fed. When it is a question of the greatest profit it is profit over cost that we are interested in.

Milking Shorthorn cattle have been the mainstay of England for over 100 years and rich and poor alike find them the most profitable cattle to own.—*W. J. Hardy,* in *Country Life.*

To succeed one must know his subject; a thin spread of knowledge over a great many things spells mediocrity. The mediocre man or practitioner is a dangerous man in the community.

Vitamin A and the War

At the start of the first world war the Germans offered such fancy prices for Danish butter that the Danes felt that it was too valuable to eat. Eye trouble at once developed all over the country, and blindness would have resulted for many if they hadn't been persuaded to eat more of their own product. A few years ago a study among some Boston university students disclosed that 162 of them had subnormal darkness adaptation, so that they couldn't see to drive automobiles at night. After the students were fed a diet rich in vitamin A, which is found most prominently in butter, their sight was restored. Lack of an adequate amount of vitamin A may predispose to respiratory diseases also.

Protection of Soldiers from Endemic Diseases

Immunization against typhus, cholera, human bubonic or pulmonic plague of all military personnel of the United States Army who may be assigned to areas where they will be exposed to these diseases has been ordered by the Surgeon General of the Army.

The order states:

"That all military personnel stationed in or traveling through Asia, Africa, continental Europe or other areas where danger from epidemic typhus fever exists will be immunized with typhus vaccine as prescribed by the Surgeon General.

"That all military personnel stationed in or traveling through Asia or other regions where cholera is known to be present in endemic or epidemic form will be immunized with cholera vaccine as prescribed by the Surgeon General.

"That all military personnel under serious threat of exposure to epidemics of human bubonic or pulmonic plague will be immunized with plague vaccine as prescribed by the Surgeon General."

★ ★ ★ Buy Defense Stamps and Bonds

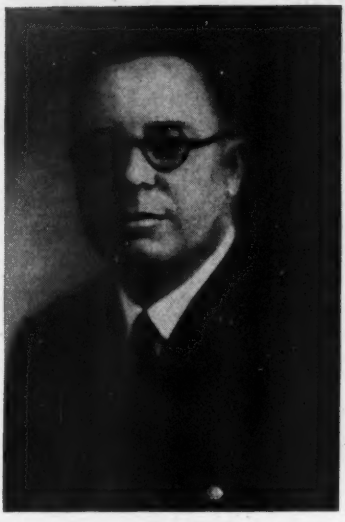
Order Revoked

Announcement has been made by the U. S. Secretary of Agriculture of the revocation of an order issued some time ago which required that reports of interstate shipments of virus, vaccines and other animal biologics, be made to sanitary officials.

Dangers in Speeding Up Production of Physicians

Already several medical schools have announced the readjustment of their curricula so that the sessions will be practically continuous, in order to speed production of physicians and possibly also to increase the total number of physicians graduating each year. For more than twenty years the medical schools of this country have accepted each year slightly over six thousand students. Each year a certain percentage of these students have been dropped from the schools because of poor scholarship or for other reasons; the total number of medical graduates has been approximately five thousand three hundred annually. More than twelve thousand graduates of colleges and some with just two or three years of college education apply each year for entrance into the medical schools. Selections are made with the greatest of care. Since a considerable percentage of those selected are still found to be unable to complete the course because of poor scholarship, many educators have been convinced that six thousand students represent all of the really well qualified candidates for the medical profession that become available. Thus the proposal to increase greatly the number of young men admitted to medical school or to modify the curriculum has caused great concern to leaders in medical education and medical practice. For more than thirty years the struggle to develop a high standard of medical education and to maintain that standard has been a difficult but a successful one.—*Jnl. of the Amer. Med. Assn.*

Veterinary Corps' First Brigadier General



As we go to press, announcement is made of the promotion of Col. Raymond Alexander Kelser, Chief of the Veterinary Division, Surgeon General's Office, War Department, to the rank of Brigadier General

Graduation at Carlisle Barracks

There were 12 veterinary officers among the 344 officers of the Medical Department, U. S. Army, who finished the two months' course of instruction on February 28, at the Medical Field Service School at Carlisle Barracks, Pa.

The instructions in military duty in the field, given the officers, consisted of field demonstrations, lectures and home study in military art, sanitation, logistics, field medicine and administration.

Major General James P. Magee, surgeon general of the army, addressed the graduating class, which was composed largely of former Reserve Officers.

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In tests on dogs, Hermann Becks, of the dental department of Hooper Foundation, found that they developed tooth decay, which is unusual in dogs, when fed a diet lacking in the vitamin B filtrate factor. In experiments with diets deficient in nicotinic acid dogs became affected with pyorrhea.

W.P.B. Orders Restrict Dog Food

Dog food produced domestically in the meat packing industry, prepared feeds industry and all other industries in 1939 totaled 732,095,000 lbs. Of this total, 501,378,000 lbs. was packed in cans, more than twice the amount sold dry. The canned dog food was valued at $22,948,000, compared with $10,519,000 for that sold in other forms. During 1937 there were 412,436,000 lbs. of canned dog food produced, while other dog food totaled 128,681,000 lbs.

W.P.B. has limited the manufacturers of canned dog food to 50% of the number of cans used during the same months of 1941.

Tin Scarcity Stimulates Research

The research departments of companies heretofore extensively engaged in the production of canned dog food are successfully overcoming the difficulties entailed in solving the problems of processing, packaging and labeling involved in the changes made necessary by curtailment of the use of tin for dog food packages. Each manufacturer is anxious to continue to supply the dog food market so that no dog will be deprived of his own particular choice of canned food.

One company* has already announced its new method for packaging of dog food. The carton is of fiber, with bonderized plate at either end and closely resembles the tin can formerly used, both in size and appearance. The food in this new package is dehydrated and in amount is equivalent to 2½ cans of the former tinned-can product. It is ready to serve on the addition of a small amount of water.

* John Morrell & Co. (Red Heart).

Support This Measure

Senate Bill 2188, just introduced by Senator Reynolds of North Carolina, recommends the appointment of an officer of the Army Veterinary Corps, with the rank of Brigadier General, as assistant to the Surgeon General. Favorable action upon this bill will put the Veterinary Corps on a par with the Dental Corps in the Army Medical Department.

Kansas Adopts Statewide Brucellosis Vaccination Plan

Kansas has just instituted a statewide calfhood vaccination plan for the control of brucellosis in cattle. The program is confined to the vaccination of calves between the ages of four and eight months. Animals must be identified by official vaccination tags or tattoo.

The brucellosis agglutination test to determine reaction 30 days after vaccination will be required, and subsequent tests will be conducted to determine whether the animal has become negative to the agglutination test. Blanks for recording tests and vaccination are to be provided by the state Livestock Sanitary Commissioner.

Costs of testing, vaccine, and services of veterinarians are to be paid by the owner of the cattle. The owner will agree not to make any claim against the state Livestock Sanitary Commissioner or the veterinarian he employs, for unfavorable results that may in any way be attributed to the use of vaccine. No indemnity is to be paid on vaccinated animals.

Upon request of cattle owners, certificates on individual animals will be supplied by the state Livestock Sanitary Commissioner, certifying that the animal in question has been vaccinated under his supervision and found negative to the agglutination test.

Query: Do you consider it ethical for a veterinarian to leave a dozen calcium-dextrose bottles with his farmer client so that he may treat his own cases of milk fever? There are six veterinarians within 15 miles of the farm.—*H. P. W.*

Comment: No, neither ethical nor advantageous to the farmer.

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Veterinary Practice Acts Should Be Broadened

At the time most of the laws regulating the practice of veterinary medicine were enacted, equine practice constituted the great bulk of veterinary service. Practice with food producing animals constituted but a minor part, and poultry and small animal practice a quite unimportant part of veterinary service. Except for sanitation, practically all of the preventive medicine that now constitutes so large a part of veterinary service was then unpracticed and unknown. Anti-hog cholera serum had not been developed, bacterins were unknown, antigens were not used, allergic and agglutination tests for the diagnosis of disease were mainly in the future. The veterinary practice acts then enacted reflected those conditions accurately. In at most only a few states is it illegal under the veterinary practice acts for a person not a licensed veterinarian to use anti-hog cholera serum and virus, tetanus antitoxin, equine encephalomyelitis vaccine, chicken pox vaccine or to in any manner treat a well animal for the prevention of disease. In other words, most veterinary practice acts, by direct statement (as e.g. in Illinois) or implication (by mentioning certain services and omitting others) regulate only the treatment of sick or injured animals or surgical operations for relief of deformity, and in most, if not all of them, all veterinary service for other than farm animals is excluded from their provisions. The treatment of poultry, and dogs and cats, which has become so important in recent years, is legally just not veterinary practice. In a number of states (e.g. Alabama) the law contains no definition of what constitutes veterinary practice. In such cases the courts would undoubtedly attempt to establish what was generally regarded as veterinary practice at the time the law was enacted and interpret that as the intent of the legislature. The laws are lame also in that they do not cover the public health functions of veterinary service, such as meat inspection, milk inspection and autopsies made for the purpose of diagnosis.

Tins of canned beef packed 50 years ago have been found recently. When opened the product proved to be in perfect condition.—*Armour Magazine.*

In tests at the Mayo Clinic gramicidin has been found more effective than penicillin against one type of streptococcus and the pneumonia germ, but penicillin is more effective against another streptococcus and a staphylococcus organism. Penicillin, which appears to have reached the stage of practical use, destroys some germs and is bacteriostatic for others.

Favorite Formulae

For simple acute agalactia in the cow, if treated within a day or so after milk secretion stops or calving.

Pilocarpine hydrochloride .....grs. IV
Strychnine sulphate .....grs. IIss
Aqua, q.s. .....ad oz. XVI
Directions: Give one-third pint orally every three hours.

For equine gastrointestinal catarrh, which is frequently evidenced by habitual attacks of colic:

Chlorazene .....drs. III
Sodium bicarbonate .....oz. XVI
Sodium sulphocarbolate .....oz. IV
Directions: Give one tablespoonful on the grain ration three times daily.

For various types of diarrhea in cattle:

Guaiacol compound .....oz. II
Oil turpentine .....oz. II
Formaldehyde .....oz. II
Sorghum .....oz. V
Aqua, q.s. .....ad oz. XVI
Directions: Give one to three tablespoonfuls every three to five hours in one half to one quart of milk as a drench.

Prescription for "Grease"

Scrub thoroughly with soap and water. Then apply daily:

Cresylic acid U. S. P. .....oz. i
Sulphur flowers .....oz. vi
Denatured alcohol .....oz. vi
Linseed oil, q.s. .....ad o ii
M.
Sig. Apply by spreading on a bandage and bandaging the affected parts snugly.

Sharp, Guthrie, and Hand believe that if vitamin C which the cows put into milk can be preserved, the vitamin C nutrition of the nation will be raised appreciably and milk must then receive greater consideration as a source of vitamin C.—*Certified Milk*.

* * * *

According to C. C. Hastings, the greater prevalence of vitamin A deficiency during recent years has not been due to any radical change in feeding methods but to the general practice of storing corn, and to a lesser extent of storing hay. Alfalfa hay and yellow corn lose 60% of their carotene content during the first seven months of storage, 75% being lost in a year's storage. Symptoms of vitamin A deficiency disappear quickly if a ration of three pounds of fresh alfalfa per day is fed to affected cattle.

* * * *

Riboflavin Necessary

Riboflavin is essential to growth and health in pigs. Patek has described riboflavin deficiency in this animal as characterized by retarded growth, corneal opacities, changes in the skin, hair and hoofs, and terminal collapse associated with hypoglycemia. Hughes concluded on the basis of his experiments that the minimum daily requirement of riboflavin by the young, growing pig lies between one and three milligrams per 100 pounds of body weight. Yellow corn and green forage are good sources of riboflavin.

Aubel, Hughes, and Peterson, of the Kansas Agricultural Experiment Station, carried out an investigation of the calcium requirements of young pigs. They found the abnormalities resulting from feeding low-calcium rations to be: anorexia; unthrifty appearance, characterized by emaciation and rough hair coat; failure of normal growth and development of bone; poor utilization of feed; and usually (though not always) unsteadiness of the legs terminating in posterior paralysis. Under the conditions of their experiments, a level of 0.25% of calcium in a ration was found to be inadequate, while 0.41% was definitely adequate for the normal development of young pigs.

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Roger J. Williams, of the University of Texas, discoverer of pantothenic acid, fifth member of vitamin B complex group, has suggested that in the future this vitamin be called "pantothen."

★ ★ ★ Buy Defense Stamps and Bonds

Diet studies at the University of Rochester indicate that whole wheat bread, in addition to supplying more vitamins than white bread, also furnishes more minerals and more proteins for energy and tissue building.

* * * *

Enriched Bread and Vitamin B_1

In 1840 food eaten by the average American supplied daily over 1000 I.U. of vitamin B_1. This was almost entirely due to the whole grain cereals, dried legumes and nuts which they ate—in a whole year this typical American consumed but five pounds of sugar.

Today, cereals (including bread) eaten by the average individual gives him about 50 I.U. per day instead of 600 as in 1840. Fresh and canned vegetables replace the dried legumes, with a considerable loss of vitamin B_1. The use of sugar has increased to 100 pounds per person each year.

The average American consumes practically the same bulk of food as in 1840 but the B_1 consumption has been cut so that instead of getting 1000 I.U. of B_1 per day from his food he now obtains about 200 to 400.

Carbohydrates (starches and sugars) constitute about 85% of our food intake. To make them available in full there must be adequate vitamin B_1. The unbalancing of our carbohydrate—vitamin B_1 intake may show itself in the disturbance of the digestive tract and the nervous system.

This needed balancing of carbohydrates and vitamin B_1 will be taken care of, to a large extent, by enriched bread, made as recommended by the Committee of Food and Nutrition of the National Research Council. By means of a new enriched yeast bakers have added to the bread nicotinic acid and iron in addition to B_1.—Excerpts from *Amer. Jnl. of Nursing*, Jan., 1942, p. 38.

Mohler To Edit New Agricultural Yearbook

Following the precedent of recent years the 1942 Yearbook of the U. S. Department of Agriculture is to be built around a single subject—animal diseases and pests. (The 1941 yearbook dealt with "Climate and Man," the 1940 with "Farmers in a Changing World," and the 1939 with "Food and Life." Previous to 1936 the agricultural yearbooks were largely statistical compilations and reports of the various bureaus of the Department.) Particular interest to veterinarians is lent to the forthcoming yearbook by the fact that Chief Mohler of the Bureau of Animal Industry is head of the departmental board charged with its publication.

In recognition of this important assignment, the *National Grange Monthly* in a recent issue published, as a fitting tribute to Doctor Mohler, an extended resumé of his work in the Bureau. The following paragraphs are taken from that resumé, not only for the information they contain, but as illustrative of the high regard in which Doctor Mohler is held by agriculture.

Dr. John R. Mohler has rendered distinguished public service in combating animal diseases and pests during a period of many years, in addition to performing the many other duties devolving upon him as chief of the Bureau of Animal Industry.

His first assignment to duty was on the field inspection force in connection with the campaign for the eradication of cattle tick fever, and the inspection of animals imported from Mexico.

While serving as chief of the pathological division of the B. A. I., Doctor Mohler detected in an importation of zebu cattle, quarantined at New York City, the dread foreign livestock disease, surra. Thus the livestock industry of the country was saved the loss of many thousands of dollars which would have occurred from this highly-communicable disease if it had been permitted to gain a foothold.

Third Chief of Bureau

Doctor Mohler is the third chief of the Bureau of Animal Industry, having been appointed to his present position on December 11, 1917. He is a pathologist, bacteriologist, veterinarian and administrator. In addition to administering an annual appropriation of approximately $15,000,000, he outlines a great deal of the investigational work to be carried on with animal diseases and parasites, as well as animal improvement through breeding and feeding. His administrative duties extend far beyond the confines of the city of Washington, employees being located in all of the 48 states, as well as in territorial possessions. To keep abreast of the work, it is often necessary for him to travel extensively.

Doctor Mohler knows how to get along with other people. This qualification has enabled him to work harmoniously with the many official agencies, federal, state and county, as well as the numerous livestock and trade organizations that come within the scope of the Bureau's activities. He is a courteous and friendly man, but resents any attempts that may be made to take advantage of him.

The tasks of administering the various laws and regulations affecting the livestock industry —dealing largely with federal meat inspection, animal-disease control and eradication, and supervision over the manufacture of veterinary biological products—claim a large portion of his time.

Combating Animal Diseases

Under Doctor Mohler's direction as chief of the Bureau of Animal Industry, marked progress has been made in combating many animal diseases. The most outstanding perhaps is the highly successful eradication work on bovine tuberculosis. This campaign, begun in 1917, was the most extensive and difficult undertaking of the kind in any country against the inroads of an animal disease. He also has directed much of the work of eradicating cattle-fever ticks in the South. This activity, which had been begun in 1906, is now about 99% complete.

It was under his supervision that the original anti-hog cholera serum, developed through Bureau research, has been improved in purity and potency, and a promising product, crystal-violet vaccine, has been found and perfected as an additional means of preventing hog cholera.

The commercial use of heat and refrigeration in destroying trichinae in pork is based on the Bureau's research on means of combating the threat of this parasite to human health.

Dips, disinfectants and sanitation, which are sturdy forts in the first line of defense against animal diseases, have been and are being given special study. In this work the Bureau has devised several valuable field tests for determining the strength of dips and otherwise aiding in destroying and preventing infection.

A simple but practical system of swine-sanitation, developed by the Bureau for protecting swine against roundworms, has enabled hog producers to raise a third more pigs from a

given number of sows. A similar service to agriculture was the finding of a successful method of combating kidney worms in swine.

Through Doctor Mohler's leadership the use of barium antimonyl tartrate, applied as dust.

Improved Livestock Management

Although lending much support to the con-

The Bureau has conducted many investigations on phenothiazine as an anthelmintic. One of the experimental animals was this ram, suffering (left) from "poverty jaw" as the result of a general parasitism. The photograph on the right shows the animal 19 days after treatment with phenothiazine had relieved the parasitic condition

livestock industry of the United States has been protected against serious losses from foot-and-mouth disease, a malady that takes heavy toll abroad. He directed the work of eradicating several outbreaks of this disease, as well as administering the quarantine measures that have excluded it entirely in recent years.

Scabies in sheep and cattle and dourine in horses have been practically eliminated through the efforts of Doctor Mohler and his staff. When European fowl pest threatened the poultry industry, prompt action by the Bureau confined the disease to a limited area, and it was soon stamped out.

Pullorum disease has been studied experimentally by the Bureau, and a stained antigen test, developed for detecting the affected birds, is now extensively used.

A recent step in controlling internal parasites of sheep and other ruminants was the discovery of the value of the chemical, phenothiazine, for this purpose.

Gapeworms have long been taking a heavy toll of young chicks each year, notwithstanding the efforts of many scientists to find an effective remedy. Through the Bureau's research an effective remedy was found in the

trol and eradication of disease, Doctor Mohler likewise sponsors investigations in the fields of genetics, nutrition and improved systems of livestock management. To put the findings of research breeding to practical use, in 1919 he inaugurated a so-called "Better Sires—Better Stock" campaign, which has stimulated improved practices in livestock production. Under his guidance the breeding of Morgan horses, which are well suited for many utility purposes, including Army service, has been conducted at the U. S. Morgan Horse Farm at Middlebury, Vt. A new breed of sheep, the Columbia, which embodies many desirable characteristics, was developed by the Bureau under the direction of its chief.

The Bureau's discoveries of a simple method of determining the grease and dirt content of wool, and of an accurate means of measuring wool fineness, have had a beneficial effect in the wool trade. Perhaps no single breeding project has caught the public fancy more than the work done by the Bureau in developing the "streamlined turkey."

The work in genetics has involved numerous breeds and types of animals of foreign origin, such as Landrace swine from Denmark, Zebu

and Africander cattle from Asia and Africa, Nonius horses from Hungary, sheep dogs from Hungary and Turkey, and Karakul sheep, Swiss goats, and poultry breeding stock from several countries. Questions relating to the palatability and other qualities of meat have been studied, and today the Bureau of Animal Industry is a recognized authority on this subject.

Keeping the Public Informed

The benefits to be derived from placing before the public the results of scientific investigations, in popular and attractive form, is recognized by Doctor Mohler, and at times he has participated in the production of moving pictures. In the Department of Agriculture picture, "Livestock and Mankind," released in 1938, Doctor Mohler is the principal character and narrator. He also appears in the film "Eradicating Tuberculosis from Poultry and Swine," which will soon be released. He has likewise turned "showman" on various occasions by directing the production and installation of extensive educational exhibits. One large display was presented at the 12th International Veterinary Congress, held in the Waldorf Astoria Hotel, New York City, in 1934. Another dealing with veterinary science and public health was a part of the New York World's Fair, 1939-40.

Doctor Mohler has taken a prominent part in the founding of regional laboratories in sections where livestock problems may be studied on their home grounds. He has written, edited, and translated numerous articles and books on veterinary subjects and the improvement of livestock through the application of scientific findings. For several years he was editor of the *Journal of the A. V. M. A.*

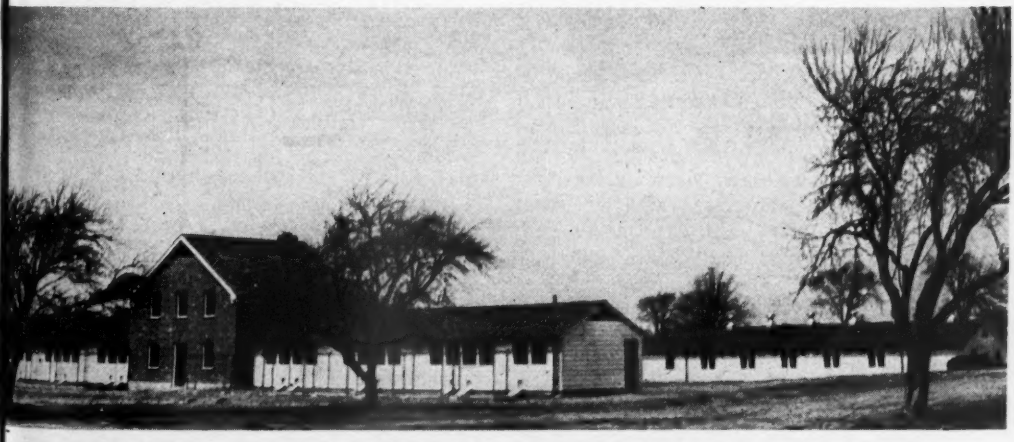
In the hall of fame of the Saddle and Sirloin Club of Chicago, a large portrait of Doctor Mohler is among those of other outstanding leaders of the livestock industry. The presentation was made in 1925, when Doctor Mohler was the guest of honor, at the invitation of the American Society of Animal Production.

On February 11, 1935, he was presented the Medal of Merit of the Philadelphia Society for Promoting Agriculture. This is the oldest agricultural society in the United States, George Washington and Benjamin Franklin having been influential in its early activities. The medal is the highest honor the society can bestow.

Doctor Mohler is a past president of both the American Veterinary Medical Association and the United States Live Stock Sanitary Association, and has been active in both these organizations for many years. He is chairman of the U. S. Department of Agriculture Poultry Committee, appointed by the Secretary of Agriculture to coordinate the numerous poultry activities of the Department.

In 1939, the A. V. M. A. conferred on him the 12th International Veterinary Congress prize for his noteworthy contributions to the advancement of veterinary science. His latest honor was received March 28, 1941, when Georgetown University presented him the Kober Foundation award. This honor was bestowed for outstanding contributions to public welfare through study and control of brucellosis.

Doctor Mohler is a member of many scientific societies, including the Society of American Bacteriologists; the Society of Experimental Biology and Medicine; the American Public Health Association; the Washington Academy of Sciences; the Washington Academy of Medicine; and the British Royal Society of Medicine.



The Bureau maintains regional research laboratories at various points throughout the country. Above are shown brooder houses, laying houses, and isolation wards used in connection with research on poultry disease at the laboratory at East Lansing, Mich.

Livestock Conditions in Montana

MONTANA, with an area of 146,997 square miles, now has approximately one and one-half million cattle and four million sheep, maintained under range and semi-range conditions. During the summer, when the calf crop averages over one-half million and the lamb crop some two million the bovine and ovine population is materially increased. In addition, there are in Montana some 250,000 horses and mules, 100,000 swine, nearly four million fowl, and a few thousand goats.

To provide veterinary service for these 12 million animals, Montana has fewer than 50 qualified veterinarians engaged in practice. This means that, disregarding poultry, the ratio of veterinary practitioners to animals is roughly 1 to 150,000—about one-tenth of the low ratio in the country as a whole.

That livestock disease problems have not become acute in this situation may be ascribed partly to geographic and climatic factors, partly to the skill and resourcefulness of Montana ranchers, and, in large measure, to the almost herculean labors of the Montana Livestock Sanitary Board and its corps of field veterinarians.

The system under which the Montana state veterinary service functions has proved to be highly efficient for that state.[1] Only time will disclose the relative importance of the ability of the present personnel and the merits of the system itself in the success which it has achieved. In any case, it is undeniable that a more nearly adequate number of veterinary practitioners would reduce the disease toll further than is possible through the notable, but necessarily limited, services performed by the state officials. If, as is believed by many, the present efficiency of the state service is to no small degree a result of the competence of those now responsible for its operation, the time may come in Montana when an adequate corps of practitioners will be not only advisable, but acutely necessary.

[1] For a description of the system, see *Veterinary Medicine*, October, 1940, pp. 553-556.

Only four new veterinarians located in Montana during the past year. It is to be hoped that, in view of the importance of this livestock producing area in the national economy, as well as in its own interest, the Montana livestock industry will be far-sighted enough to encourage the augmentation of the ranks of qualified veterinarians practicing in the state.

The foregoing should not be lost sight of in noting the favorable conditions reflected in the report of the Montana Livestock Sanitary Board for the fiscal year ended November 30, 1941, from which the following excerpts are condensed.

Horses

No cases of glanders nor dourine were reported in Montana during 1941.

There were 279 cases of equine encephalomyelitis reported, with 76 deaths. The mosquito has been incriminated by several investigators as the vector of this disease. While there is no denying the fact that mosquitoes have transmitted encephalomyelitis experimentally and that the virus has been found in naturally-infected mosquitoes and ticks, it is doubted that these insect vectors are responsible for the great spread of encephalomyelitis in horses. The nasal secretions of infected horses have been found to carry the virus in a number of cases, and while there are no research data on which to base the theory, clinical observation indicates that the fly may carry infected nasal secretions from the horse.

A number of cases of human encephalitis occurred in Montana during the year, many of them caused by the equine virus.

Chest abscesses due to *Corynebacterium ovis* were first noted in Montana horses in 1939. Several cases were reported in 1941, but the incidence was lower than in 1940.

Distemper made its appearance in quite a number of horses during the spring and summer; in some the condition was rather severe. This year an autogenous vaccine was employed, which seemed to give better results than regular stock vaccine.

Infectious anemia still appears in certain districts from time to time. As yet there is neither cure nor practical preventive for this disease.

One case of periodic ophthalmia, the first in a number of years, was reported.

The control of intestinal parasites continues to be a major problem.

Cattle

Montana has probably never enjoyed a better calf crop than in 1941. It is estimated at approximately 85%—a percentage that seldom, if ever, has been equaled in this state.

The entire state continues as a modified accredited tuberculosis free area. During the year 43,013 cattle were tuberculin tested, with 40 reactors—a percentage of 0.09%. A number of cases of skin lesions caused by an acid-fast organism (not the tubercle bacillus) were found; also several instances in which reacting cattle were infected with the avian type of the tubercle bacillus.

During 1941, in cooperation with the Bureau of Animal Industry, U. S. Department of Agriculture, the Montana authorities tested 48,750 cattle for bovine brucellosis, finding 1,717 (3.5%) positive reactors and 1,412 (2.89%) giving a suspicious reaction. The Livestock Sanitary Board offers cattle raisers two alternate plans for the eradication of bovine brucellosis: (1) Blood testing of cattle with the immediate disposal of reactors with indemnities, with or without calfhood vaccination. (2) Blood test with gradual disposal of reactors, with calfhood vaccination and without indemnity. Calfhood vaccination, when properly conducted, has proved to be a splendid aid under Montana conditions in controlling and eradicating brucellosis. Since there is at present no known method of differentiating between the positive reaction that follows vaccination and that which accompanies natural infection, calves that are to be shipped interstate should not be vaccinated; only those that are to be held for herd replacement purposes. The Livestock Sanitary Board has recorded a U punch in either ear as an official identification for calves vaccinated under official supervision.

The number of cases of coccidiosis reported decreased during 1941.

Psoroptic mange was not in evidence during the year. Six cases of sarcoptic mange were found in cattle shipped into the state. All affected cattle and exposed herds have been dipped, and there are no known cases at present.

No anthrax was reported in 1941. One case of Johne's disease; two of filariasis; and one of malignant catarrh were reported, the latter representing the first known occurrence of this rather fatal disease in Montana.

Bacillary hemoglobinuria, first diagnosed in Montana in January, 1940, continues to appear sporadically. This disease, caused by the anaerobic organism *Clostridium hemolyticum*, is an elusive one, and it has not been possible in any case to trace definitely the source of infection or mode of spread. It is possible that the organism may be a natural habitant of the soil in certain areas, needing some activating influence to make it pathogenic. Liver flukes may play a part in the development of the disease, or individual animals may be carriers. Clinical symptoms of bacillary hemoglobinuria are: high temperature, rapid pulse, depression, stiffness, and voiding of port-wine-colored urine. The most definite post-mortem findings are liver infarcts and petechiate, dark-colored kidneys. Lesser post-mortem lesions include extensive hemorrhages of the omentum, omental and subserous hemorrhages in the abdominal viscera, hemorrhage into the bowel and subcutaneous and intermuscular pink to red edema.

W. J. Butler, State Veterinary Surgeon of Montana, Secretary and Executive Officer of the Montana Livestock Sanitary Board

Twenty-four cases of pulmonary emphysema were reported. Whether this disease is due to a complex plant sensitization or to a specific organism or group of organisms, has not been determined.

Screw worms were observed for the first time in Montana this summer. They appeared to have been brought in with a shipment of cattle from Mexico. It is doubtful that these parasites will ever become a problem in Montana, since the mature fly would have difficulty in withstanding the winter weather.

A number of shipments from Mexico and southwestern states were infested with the spinose ear tick. This tick has never been a problem in Montana; however, it bears watching, since it has been found in previous years on wild animals in a northwestern county of the state, although never on domestic animals in that area. The recommended treatment is syringing the ear with a pine tar-cottonseed oil mixture.

There was more foot-rot in cattle during

1941 than in any previous year. Whether this is true foot-rot, as found in sheep, has not been determined. In most cases the *Bacillus necrophorus* has been found as a secondary invader, and not as the primary cause. It is much more amenable to treatment than foot-rot in sheep. The foot should be thoroughly cleaned and the diseased area covered over with a paste made of a bland oil such as mineral and olive oil and sulfapyridine or sulfathiazole. If there is a fistulous tract present, the thin paste should be injected into it. After treatment with the paste the foot should be bandaged and the bandage left on for several days.

Two familiar scenes on western ranges: above, the round-up; right, driving a band of 3000 sheep to market

Tetanus and malignant edema, respectively, were reported in two groups of bull calves castrated in dusty corrals; a warning against performing such operations under insanitary conditions.

Cysticercosis continues to make its appearance in cattle fed beet tops in sections where Mexican and Filipino labor has been employed.

Infectious keratitis was again prevalent. The theory of its association with a vitamin A deficiency was further shaken this year; it is impossible to conceive a vitamin A deficiency during a growing season like that enjoyed by Montana last summer. A commercial vaccine has been used with good results in some instances. An autogenous vaccine made from the eye discharges is suggested as a preventive.

Blackleg still makes its appearance; usually in unvaccinated calves and yearlings. Its occurrence in vaccinated calves is probably due to the practice of vaccinating young calves but once. If the animals are vaccinated when very young, they should be revaccinated after they have been weaned, especially in districts where the disease is particularly virulent. Another factor may be vaccinating for several diseases at one time; if more than one vaccine is administered simultaneously, the immunity conferred appears to be reduced by approximately 30%.

Sheep

The lamb crop, like the calf crop, was exceptionally good in 1941, and in most sections the lambs made excellent gains.

The lamb feeding industry in Montana has grown by leaps and bounds during the last few years. Naturally, in the force feeding of lambs or any other animal, there is greater danger of digestive upsets than where natural growth occurs, and increased susceptibility to bacterial invasion.

Coccidiosis has been observed in quite a number of feeder lambs, and a study of this condition has been made a major project by the Veterinary Research Laboratory at Bozeman. The appearance of this disease is greatly aggravated when lambs are weaned, moved off their home range, and placed immediately into feedlots. Clinical observations indicate that the disease may be materially minimized if lambs are placed on pasture for 10 to 14 days just prior to being placed in the feedlots.

A protozoon of the genus Globidium has been found in sheep by Hadleigh Marsh of the Veterinary Research Laboratory, and two cases were diagnosed also in the Livestock Sanitary Board laboratory. This is an intestinal parasite which attacks the mucosa of the intestinal tract. In infected sheep the entire length of the small intestine may be studded with small white cysts. Usually it causes a severe diarrhea with many of the symptoms of coccidiosis, for which it may be mistaken. Treatment similar to that administered for coccidiosis is recommended.

Intestinal helminths continue to be, and undoubtedly always will be, a problem in animals that are herded and that graze over a limited area, especially a moist one. Phenothiazine has proved to be a very effective and reliable anthelmintic for sheep.

One case of Johne's disease in sheep was diagnosed in 1941.

Swine

Hog cholera is not prevalent in Montana. During 1941 it was found on 20 premises; in practically every instance following the feeding of infected garbage. Twenty-nine cases of swine erysipelas were reported during the year.

Mercuric poisoning, which has occurred on several occasions in the past, was not reported in Montana during 1941.

Poultry

Although the Livestock Sanitary Board is commissioned with the duty of preventing, controlling, and eradicating diseases of poultry, no appropriations for the investigation or control of poultry disease have ever been made available to it. However, a number of examinations of tissues from diseased poultry were made during the year, as well as a number of field investigations of poultry diseases. At a number of exhibitions a trained technician was assigned to prevent any diseased birds from entering the show and to diagnose and treat such disease conditions as might make their appearance. The board held a school in the laboratory at Helena to train poultry men in methods of diagnosing and controlling pullorum disease. Following attendance at this school, 10 hatchery men were approved to carry out the agglutination test for pullorum disease in flocks supplying their hatcheries with eggs.

Wild Animals and Game Birds

Among wild animals and game birds, the following conditions were diagnosed by the laboratory during the year: *E. coli* abscess in a deer; *Cysticercus tenuicollis* in deer; various parasites in deer, mountain goats, and pheasants; cardiac failure in elk; teniasis in ducks and sage hens; botulism in ducks; louse fly and foot worms in deer; sarcosporidiosis in ducks; trauma in a deer; and pseudotuberculosis in deer.

Dairy and Meat Inspection

The employment of a state-wide dairy inspector has resulted in the carrying out of an even better system of dairy inspection than has obtained in the past. In all the milk samples analyzed during 1941, not one case of adulteration or the addition of a preservative was found. During the year the Livestock Sanitary Board issued 895 dairy licenses and 47 milk plant licenses.

A study of meat inspection reports from Missoula and elsewhere in Montana indicates the necessity of meat inspection as a safeguard of public health. To carry out an efficient system of meat inspection in a state as large and as sparsely settled as Montana is a difficult problem. The Livestock Sanitary Board recommends to the various municipalities that they establish meat inspection wherever this is practicable. In 1941 the board issued 45 slaughter house licenses. This does not mean that meat inspection is maintained on these premises; merely that they have passed a sanitary inspection.

Tests and Clinical Investigations

During the year, 56,013 specimens were examined in the bacteriological laboratory, including blood, pus, water, bonemeal, milk, cream, meat, insects, parasites, tissues, skin scrapings, exudates, feces, and feeds. Chemical analyses of 1,185 samples were made.

Including work done cooperatively with the Bureau of Animal Industry, U. S. Department of Agriculture, the Livestock Sanitary Board conducted various tests and/or clinical inspections of 7,695 horses, 385,783 cattle, 1,797,892 sheep, 36 goats, 36,617 swine, 3,648 fowls, 546 dogs, and 53,212 animal carcasses—a total of 2,382,442 inspections.

In performing their assignments, the board's district deputies and the milk inspector traveled a total of 221,500 miles; resident deputies traveled an estimated 78,500 miles.

Western waterfall in the sheep and rattlesnake country

Umbilical Hernia in Large Animals*

UMBILICAL herniae in animals can be classified as congenital and juvenile. The congenital hernia in the foal and calf is present at birth, resulting from a develring by fibrous tissue. The covering of the sac is the skin. The hernial ring is a defect in the recti muscles, which are separated at the level of the umbilicus, with the long axis following the median line. In many instances, definite thinning of the abdominal wall is observed anterior and posterior to the ring, particularly in cattle. Therefore, the primary purpose of surgical correction is the restoration of the proper relationship of the two recti muscles. The contents of a hernia in the foal are most commonly a loop or more of small intestine. In the calf the position and size of the rumen frequently prevent the escape of viscera to this position, and the sac is empty. With very few exceptions all herniae of this nature are reducible.

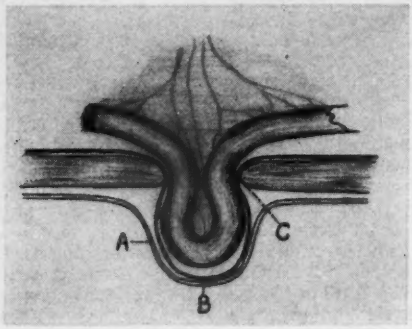


Fig. 1. Hernia showing relative position of structures. A. Skin; B. Hernial sac; C. Hernial ring

opmental defect during intrauterine life. The juvenile hernia occurs soon after birth when a weakened umbilical scar yields to increased intra-abdominal pressure from various causes. The congenital type is frequently overlooked at birth, but becomes more evident with age. In some instances umbilical herniae, particularly in the foal, will disappear spontaneously by the time the animal reaches the age of six to nine months. Others grow proportionately with the growth of the animal and the abdominal wall. Although acquired umbilical herniae may be observed, they must be very rare. Therefore it is proper to state that, almost without exception, umbilical hernia observed in animal life is the result of disease, and not of an accident.

Unless a hernia of this nature has been traumatized accidentally or by operative failures, one usually finds that the component parts—the sac, the neck, and the covering of the sac—are rather definite and uniform in their relations. The sac, which is formed of peritoneum, is thin, but may undergo thickening with increase of size, due to the weight of the contents, and with advancing age. The neck of the sac is tightly adherent to the margins of the muscular

Preoperative Care and Anesthesia

The animal should be starved for 24 hours previous to the operation. Subsequent surgical preparation consists of shaving and thoroughly cleansing the field with soap and water, followed with alcohol. Any reliable antiseptic, such as merthiolate, is used on the skin previous to the operation. Because complete relaxation is indispensable for a successful operation, general anesthesia should be administered. A 7% solution of chloral hydrate introduced intravenously until all reflexes are abolished is very satisfactory. Relaxans or nembutal may be used by the same method. General anesthesia may be supported by local infiltration and edematization of the tissues with a 1% solution of procaine, but this is usually unnecessary unless a prolonged operation is expected. The animal is placed in a dorsal recumbent position.

Aseptic technic should be followed and the field protected with sterile shrouds.

An elongated elliptical incision is made including the umbilicus and hernia through the skin only. The incised skin is carefully removed, thus exposing the hernial sac. Dissection of the skin and superficial fascia is continued to the neck of the hernial sac. At this point there is always encountered a fibrous union which is carefully dissected, care being taken to stay outside the peritoneum. After the hernial ring is freed

*Notes from a discussion by James Farquharson, Colorado State College, Fort Collins, Colo. The drawings accompanying the text are by Mr. W. E. Beggs, a junior veterinary student at Colorado State College.

Doctor Farquharson is here shown performing the operation for umbilical hernia described in the accompanying text. The patient is a 1½-year-old Guernsey heifer presented for treatment at the Purdue University Annual Short Course for Veterinarians October 15-17, 1941. The animal had previously undergone one or two unsuccessful operations for correction of the condition. This operation was highly successful

1. Start of operation. An elliptical incision is made through the skin only over the hernial sac. 2. Dissection of the incised skin from the hernial peritoneal sac. 3. Dissection of overlying tissues (skin and superficial fascia) from the side of the hernial sac. 4, 5. Breaking down and dissection of adhesions between hernial sac and hernial ring. 6. Undermining the deep surface of the abdominal wall from the thickened peritoneum. 7. Freeing the abdominal wall at anterior and posterior commissures of hernial ring. 8. Placing first overlapping mattress suture through abdominal wall to obliterate hernial ring. Hernial sac is inverted into the abdominal cavity at this stage. 9, 10. Mattress sutures placed loosely in position before tying. 11. All sutures pulled taut and tied. 12. Hernial ring repaired. Last mattress suture in position for tying. 13, 14. Suture of the protruding margin of the hernial ring to the underlying abdominal wall. 15. Repair complete except for skin closure. 16. Suture of skin and completion of the operation

from the sac the recti muscles are undermined for a short distance from the overlying peritoneum. Approximation of tissues

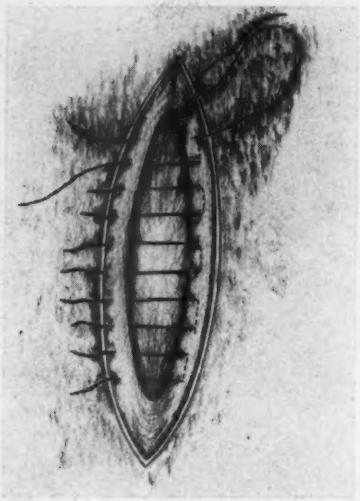


Fig. 2. Hernial sac inverted into abdominal cavity. Mattress sutures in place

can be facilitated occasionally by incising the anterior and posterior commissures. At this stage the hernial sac is inverted into the abdominal cavity.

With the edges of the ring exposed, series mattress sutures of No. 24 kangaroo tendon or No. 4 four-day chromic catgut are introduced, starting ¾ to 1 inch above the edge of the upper portion of the ring. This is carried to a similar position below the lower portion of the ring from the superficial surface. The suture is completed by carrying it back to the upper wall. All mattress sutures are placed ½ inch apart before any attempt is made to tie. When suturing has been completed, the sutures are pulled taut so that the lower edge of the hernial ring will slide under the upper edge in an overlapping position. Sufficient tension is exerted on the sutures at this stage to keep the tissues securely in place until they are progressively tied. The exposed edge is next sutured with No. 4 chromic catgut to the underlying abdominal wall. This may be accomplished by means of an interrupted or continuous suture. Implantation of sulfanilamide is recommended and is a sound procedure. The superficial skin incision is closed by means of interrupted No. 3 tension suture. The wound is covered with collodion and a layer of gauze. Support with adhesive tape around the abdomen is recommended in instances of large herniae. Tetanus antitoxin should be administered where indicated.

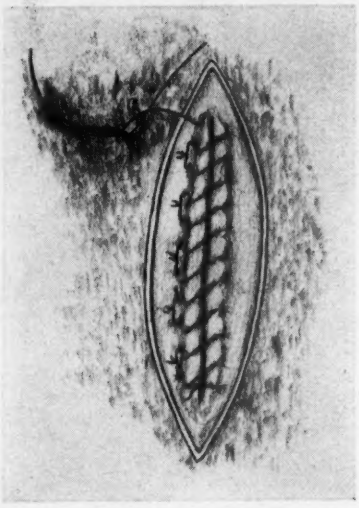


Fig. 3. Mattress sutures tied. Continuous suture of edge of hernial ring to abdominal wall

If the operation has been performed under asepsis the wound should heal by primary union. The skin sutures are removed in ten days. The animal should be kept on light feed for five to six days. Bulky and gas-producing feeds should be withheld for a week.

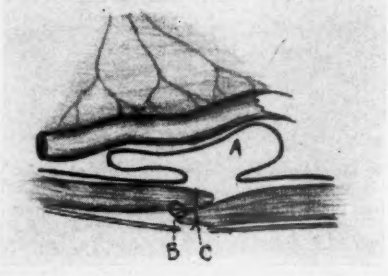


Fig. 4. Transverse view of suturing completed, demonstrating position of former hernial sac and overlapping of abdominal wall. A. Former hernial sac, inverted; B. Continuous suture; C. Mattress suture

Report on a Case of Acetonemia in a Cow*

By H. P. STEYN
Onderstepoort, Union of South Africa

ALTHOUGH acetonemia is a fairly common disease of dairy cows in Europe and America I have been prompted to report this case in some detail because the disease is either uncommon in South Africa or is usually not recognized. It is mainly a disease of well-fed dairy animals which do not have much exercise. It is described as one of the group of metabolic disorders, is often confused with milk fever, and frequently unsuccessfully treated as milk fever.

The symptoms observed in the case to be described were classical and may serve as a useful guide to colleagues encountering the disease.

A Friesland cow in exceptionally good condition, commencing the third lactation, calved normally on September 27, 1940. The first symptoms of illness were noticed during the days between October 13th and 18th; that is, approximately 14 days after calving.

The cow had been kept in a small paddock, about a quarter of an acre in size, since her first pregnancy. There was a small amount of grazing consisting mainly of garden weeds and grass. The only plant suspected of being toxic which could be found was *Erigeron linifolius*.[1]

The animal had been dried off about three months before calving, from July 1, 1940. The ration during the dry period had consisted of lucerne and teff hay *ad lib.* A green feed of fresh lucerne and occasionally oats was given in the evening with a small dishful of a concentrate mixture consisting of: yellow crushed mealies 400 lb., wheaten bran 200 lb., peanut-cake 200-lb., bonemeal 60 lb. and salt 20 lb. After having had the evening feed in the stable the cow was taken back to the small paddock which adjoined the stable. Exercise was, therefore, restricted. During the last 10 days before calving the concentrate mixture was stopped and a smaller amount of pure bran was fed.

Pure bran was continued for about a week after calving and thereafter the usual concentrate ration gradually introduced, but this was not eaten with the usual relish, and the full ration was never consumed. The hay ration and green feed were eaten well and in normal quantities. During the period October 13th to 18th the appetite became capricious and concentrates were completely refused, whereas the weeds and green growth in the small paddock were greedily consumed. The plant *E. linifolius*, which had been disregarded before, was now found by the owner to have been cropped short over the whole paddock. The milk yield had meanwhile been decreasing steadily and the animal was noticed to have lost condition.

On October 20th nervous symptoms suddenly appeared. These consisted of torticollis and circling toward the left side. The symptoms were somewhat reminiscent of cotyledon poisoning. Rumination, which had been normal, now stopped. The temperature was normal, ruminal movements decreased, and atony of the rumen was diagnosed by the owner. Feces decreased in quantity and became hard.

Vegetable poisoning was suspected and a bottle of raw linseed oil and 2 oz. turpentine was administered. On the 21st, ruminal atony and constipation were considered to be the most prominent symptoms requiring relief, and during that evening ¼ grain physostigmine was injected subcutaneously at half-hourly intervals until defecation took place. The feces were dry.

During the 22nd the appetite improved somewhat and there was general improvement. Concentrates were taken in small amounts, but at times the animal seemed to be somewhat unsteady on its legs.

There was no change in the condition of the animal until the 24th. During the forenoon of that day the owner observed noth-

*Reprinted from the *Journal of the South African Veterinary Medical Association* 12:3, pp. 86-89.

[1] This plant was identified by the Botanical Section of the Department of Agriculture in Pretoria.

ing which could make him suspect that improvement was not being maintained. When, however, he again saw the animal during the late afternoon, marked nervous symptoms had developed. They were: widely dilated and staring eyes, a degree of coma and stupidity of expression, slight torticollis and circling to the right, paresis and motor incoordination. It was found difficult to drive the animal out through the paddock gate and into the stable, because of the nervous symptoms described. The pulse was slow but remarkably full and strong.

As the owner was going out for the evening he decided to give an intravenous injection of calcium gluconate and I was asked to administer it. It was at this stage that I saw the animal for the first time and made a tentative diagnosis of acetonemia. This was confirmed by analysis of the blood and urine on the following day. The clinical diagnosis was based on the symptoms and history described and on the presence of a smell of acetone or chloroform on the breath. The last symptom, provided it can be clearly and unmistakably recognized, is regarded as pathognomonic of the disease. Clinical observations should be confirmed by the urinary test described by Udall.[2]

The treatment immediately adopted was that which is most commonly recommended (Udall), viz., the intravenous administration of large quantities of glucose and the administration *per os* of a saline purgative and sodium bicarbonate. By October 25th the general condition and appetite had greatly improved, but acetonemia, acetonuria, and the odor of chloroform on the breath were still marked. The treatment described was repeated.

The clinical condition of the animal continued to improve gradually during succeeding days, but this improvement was slow and the results of blood analyses, shown in the table, indicated that there was only slight improvement in the amount of acetone bodies present. After the 25th the administration of glucose was not repeated, but sodium bicarbonate was given in the feed.

[2] Udall, D. H., 1933. *The Practice of Veterinary Medicine.*

J. W. Groenewald, of this institute, was consulted about the case, and he brought to our notice an article by Carlström, Myrbäck and Larsson.[3] These authors reported

Acetonemia is generally regarded as a disease of well-nourished cows. In the southeastern states, however, where this disease is as common as is milk fever, J. T. Alston finds it chiefly in poorly-nourished animals like the one shown above

the successful treatment of acetonemia with vitamin B_1. They advanced the theory that acetonemia and a number of other metabolic diseases are associated with and may be caused by a vitamin B_1 deficiency, and they recorded critical observations in support of their claims. This vitamin, according to these workers, is synthesized in the digestive tract of ruminants, and digestive disturbances may therefore cause acetonemia as a secondary complication.

As a result of a recommendation made by Doctor Groenewald, 2cc of betaxan (a vitamin B_1 preparation), was injected intravenously on October 29th. The rapid drop in the acetone bodies in the blood is indicated by the blood analyses made on October 31st. This improvement in the blood was accompanied by an even more marked

BLOOD ANALYSES IN ACETONEMIA

Blood constituents (in mgm per 100cc)	Dates 10-25-40	10-28-40	10-31-40
Acetone and aceto-acetic acid	35.30	38.20	11.12
B-hydroxy-butyric acid	21.00	10.15	16.92
Total acetone bodies*	56.30	48.35	28.04
Phosphorus	3.6	3.7	3.8
Calcium	8.1	8.3	8.3

*The normal figures for total acetone bodies are approximately 1-2 mgm per 100cc.

[3] Carlström, B., K. Myrbäck, and A. Larsson, 1939. Biochemical studies on B_1 avitaminosis in animals and man. *Acta Med. Scand.* 102:3, pp. 175-213.

clinical improvement and thereafter the cow made an uninterrupted recovery. No further analyses were undertaken.

Discussion

The history of this case was classical, viz., the appearance of a poor appetite affecting especially the inclination for concentrates, followed by the appearance of definite symptoms approximately two to three weeks after calving. The whole syndrome, including the temporary improvements and subsequent recurrence of symptoms, was typical of acetonemia.

The possibility has been suggested that the plant ***E. linifolius,*** which is said to contain tannic acid and exercise a remarkably astringent effect when consumed, caused the primary digestive disturbance which was followed by the development of acetonemia. This theory would apparently be strengthened by the suggestions of Carlström, Myrbäck and Larsson; but opposed to this is a common observation that acetonemia is associated with a capricious appetite, and the fact that the plant under consideration had apparently not been grazed before by this cow, nor its mate in the same paddock, indicates that the abnormal appetite present after the first symptoms of the disease had developed may have been the primary condition. The ingestion of this plant would then have been merely incidental to the abnormal condition of the cow and not the primary cause of the condition.

The similarity of acetonemia to milk fever is striking and is the commonest cause of an incorrect diagnosis in cases of acetonemia. This similarity led the owner to suspect milk fever and prompted his decision to administer calcium gluconate. The calcium and phosphorus content of the blood was therefore determined and the values obtained are reproduced in the table. The phosphorus figures must be considered rather low (Groenewald [4]) but if this observation is of any significance in this disease it is not yet understood.

[4] Groenewald, J. W., 1935. The influence of rations low in certain minerals on the composition of the blood and milk of cows, and on the blood of their progeny. *Onderstepoort Jnl. Vet. Sci. and Anim. Indust.* 4:1, pp. 93-165.

Objections to Brucellosis Vaccination Unfounded

Two objections advanced by persons opposed to the use of vaccine in preventing brucellosis of cattle, or Bang's disease, are that (1) strain 19, used for this purpose, might regain its full virulence in the vaccinated animal's body, and (2) the vaccinated animals might be a source of exposure to associated cattle free of the disease.

Several years ago, an experiment was begun to determine whether the virulence of strain 19 *Brucella abortus* could be enhanced by serial passage through pregnant cattle. A normal, pregnant cow was injected intravenously with approximately 90 billion of strain 19 organisms, which resulted in abortion. A culture of Brucella recovered from the uterine discharge was used to expose similarly a second pregnant cow, which likewise aborted. This procedure was followed successively through a total of seven cattle. After the recovery of the organism from each aborting animal, comparative tests were made in guinea pigs to determine possible alterations in virulence, and at the same time like quantities of the original culture of strain 19 were injected into other guinea pigs used as controls. A total of nine normal pregnant cattle were employed throughout the course of the experiment as contact exposure controls. No sanitary precautions were exercised in disposal of aborted fetuses and afterbirths, these materials providing contact exposure for the control animals. The guinea-pig-control tests on the virulence of the Brucella organisms recovered from the aborting cattle showed no appreciable difference from those of the original strain 19 in the ability of these organisms to produce lesions or agglutination titers. None of the control cattle aborted, and in no instance was *Br. abortus* recovered from the colostrum, afterbirth, or uterine discharge of these animals. However, about half of these controls developed transient titers of 1:25 to 1:50 at one time or another. All but four of the 16 cattle involved have passed through their second pregnancy with no evidence of established virulent infections.—*Ann. Rept. Chief of B. A. I.*

Swine Enteritis*

By R. O. NYE, Buda, Illinois

SWINE ENTERITIS is undoubtedly the most costly disease to the swine industry. Its control means the difference between profit and loss to the producer. Its presence enforces strict sanitary measures, the purchase of hog houses and other equipment that can be moved at least once a year to clean ground, and the hauling of feed and water to these premises, as the price of success. This disease has stimulated quackery to a point where every peddler has a cure for "necro." This quackery alone extracts thousands of dollars annually from producers—dollars for which little or nothing of value is received. When we add all of the money spent for the control of enteritis to the actual loss from the disease, I think it exceeds the losses due to hog cholera at the present time.

Enteritis is defined as an inflammation of the intestine. Its causes are many. Those that interest us most are dietary faults, pathogenic bacteria, intestinal parasites and chemical irritants. Swine enteritis is not a new disease. Its importance to us as practitioners has made it one of the most discussed of diseases for many years. It appears, however, that its control is becoming more complicated each year and that we must be more observing of the fundamental causes before arriving at a diagnosis or treatment.

In my practice there is less enteritis when hogs are bringing a good price than when they are cheap, chiefly because hogs are fed a better balanced ration when prices are high. The producer is more willing to purchase commercial feeds to supplement and balance those of his own raising when he can receive a fair compensation for his efforts. This coincides with the finding on California ranches, where less enteritis is reported among garbage-fed hogs than among those fed grain. This brings up the question as to whether certain types of enteritis are chiefly nutritional or whether the animal has more resistance to infection when fed properly.

White Scour of Sucklings

White scour is one of the most fatal diseases of suckling pigs. It is estimated that, in the United States, nearly 10 million pigs are lost annually from this malady. In my opinion there are two chief causes, one dietary and the other infectious. Both show the same symptoms; a marked depression, rough hair coat, hind parts smeared with liquid feces, and a tendency for the pigs to huddle in their nests. The disease makes its appearance when the pigs are anywhere from three weeks to four weeks of age. Postmortem examination reveals a gastroenteritis with varying degrees of pneumonia and peritonitis. In untreated cases death may occur in from one to several days; or if the pig recovers it is stunted for a time.

In the dietary type of white scour in sucklings one finds that the ration of the sow has been deficient during gestation, or has not been properly cut down before or after farrowing. Sows fed heavily for the first two weeks after farrowing produce more milk, as a rule, than small pigs can digest, and a gastritis is set up. This type is easily treated. The sow is taken off feed completely for 24 hours and some medication, such as formalin or alkaline solution, is added to the drinking water. For the next few days the sow's feed is restricted to a dry, whole oat ration. Then corn is gradually added, along with supplements.

The second or infectious type of this disease is usually found where sanitation is poor and housing is bad. It is difficult to treat and the mortality is high. The sows and pigs should be moved to clean surroundings and housing conditions improved. The chief organism found in this type is *Es. coli*. The post-mortem lesions may be of septicemic character. They should not be confused with other septicemias, such as hog cholera. In my practice the injection of

*Presented at the 60th annual meeting of the Illinois State Veterinary Medical Association, Springfield, Ill., January 22-23, 1942.

1cc of calf scour bacterin, repeated in 48 hours if necessary, has given beneficial results. The drinking water of the sow should be medicated also.

It apears likely that if the sow's ration during gestation be adequate in vitamin A, both types of scour in sucklings may be less prevalent.

Necrotic Enteritis

Infectious gastroenteritis ("necro") is a highly infectious disease of pigs from six weeks to four months of age. It is caused by the primary invasion of *Salmonella suipestifer* followed by *Actinomyces necrophorus*. The disease usually makes its appearance in lots where hogs have been raised for years and where sanitation is not practised or cannot be carried out under the existing conditions. It is properly termed a filth-borne disease. However, it may make its appearance under seemingly the most ideal setup for hog raising.

The symptoms vary, but the most characteristic is the passing of black, semiliquid feces. The disease is sometimes very acute, death taking place in 36 hours; in other cases it may hang on for months. In the chronic type the hair coat becomes rough and dry, the animals eat sparingly, there is a gradual tucking up of the abdomen, and general emaciation ensues. On autopsy the lesions found are confined mostly to the colon and cecum. In the acute type the mucous membrane of these organs is highly congested; the bowel contents are liquid in some cases, in others hard and covered with a cheese-like exudate. In the chronic type ulcerations are plentiful in the cecum and colon along with the necrotic tissue. In both types some involvement of the mesenteric lymphatics occurs.

A disease closely resembling necrotic enteritis is called by some pig pellagra. The symptoms and post-mortem findings are similar to those of chronic infectious gastroenteritis. The cause is a vitamin B deficiency. Its appearance is slow and gradual, quite in contrast to the infectious type.

Experimental work at Michigan State College showed that feeding a ration deficient in nicotinic acid induces a condition which resembles necrotic enteritis, and that when this vitamin is added to the ration, recovery from this condition gradually takes place. The farm press took up the matter, and lengthy articles appeared stating that all the swine raiser has to do if "necro" is present in his herd is to give the affected animals 100 milligrams of nicotinic acid apiece for a few days to effect a complete cure. At the University of Ohio the value of nicotinic acid in the treatment of swine enteritis was found to be questionable. A group of pigs being fed a balanced ration was divided into two groups. One group was fed 200mg of nicotinic acid daily for three weeks before exposure to enteritis organisms. The control group received no nicotinic acid. The results were that the pigs receiving nicotinic acid had no more resistance to the infection than those not receiving it.

In summarizing my experience with necrotic enteritis, these conclusions may be drawn:

1. An enteritis exists that is caused by a specific infection and can be treated as such.

2. An enteritis exists which resembles the infectious type but is due to an inadequate ration, low in the vitamin B complex.

In treating necrotic enteritis we must first determine the cause. In the infectious type the pigs should be placed on clean ground, the ration should be balanced, but should be soft and easily digested. An alkaline solution may be added to both the feed and drinking water.

In treating enteritis of the dietary type, the faults in the ration should of course be remedied. If it seems the ration has been inadequate I feel that the addition of nicotinic acid to the feed is of value.

Hemorrhagic Enteritis

Hemorrhagic enteritis (bloody scour) is a highly infectious disease. The organisms

The control of swine enteritis often means the difference between profit and loss to the producer.

responsible have not been determined. It differs from necrotic enteritis in that it attacks hogs of all sizes and all ages. The course of the disease varies. Death may occur within a few hours or the animal may live several days. In some herds the death rate is high; in others it is low. The most characteristic symptom is a severe, bloody diarrhea. Marked depression is noted in some, while others will eat up until a few hours before death. An intense hemorrhagic inflammation of the intestinal mucosa is found on post-mortem examination. The lumen of the bowel contains large quantities of blood, and the wall is edematous. The mesenteric lymph glands are swollen and enlarged.

This disease has been spread largely by infected animals sold through sales barns and at community sales. Once established in feedlots it may make its appearance for years. No immunity is conferred by an attack.

Treatment while the animals are running behind cattle is inadvisable. In fact, there have been times when every known treatment has been tried without success. Recently the salt treatment, described in the October, 1941, issue of VETERINARY MEDICINE, has been that of choice. Good results have been obtained when it is started early.

Place the hogs on a concrete feed floor if possible. This should be cleaned at least once a day. Merely putting the hogs on clean ground is of little value, for in a few days this ground also is contaminated. The animals should be given all the buttermilk they can drink, three times a day, with 3½ pounds of salt added to each 15 gallons of buttermilk. This treatment is repeated daily for four days. For the next three days nothing but plain buttermilk is given. The salt treatment is then repeated for an additional four days. At the end of this time some solid feed may be added. I have used this treatment on several herds and have not as yet encountered salt poisoning. An adequate water supply not over 20 feet from the feed troughs is essential if bad results are to be avoided. Later on, if the disease reappears, the treatment should be repeated. I have used this treatment on the acute type of infectious gastroenteritis also with very satisfactory results.

Coccidiosis

An enteritis confined chiefly to the small intestine is produced in swine by coccidia. The course of the disease varies from a mild diarrhea to severe intestinal hemorrhage. It is usually found where sanitation is poor and the animals are drinking from contaminated water holes. On post-mortem examination we find the small intestine very much enlarged in severe cases. The mucous membrane may be hemorrhagic or ulcerated, depending on the severity of the outbreak. The diagnosis may be verified by laboratory findings.

Treatment consists of giving easily digested feed to which an astringent has been added, and changing pastures every 10 days in order to break the life cycle of the coccidia.

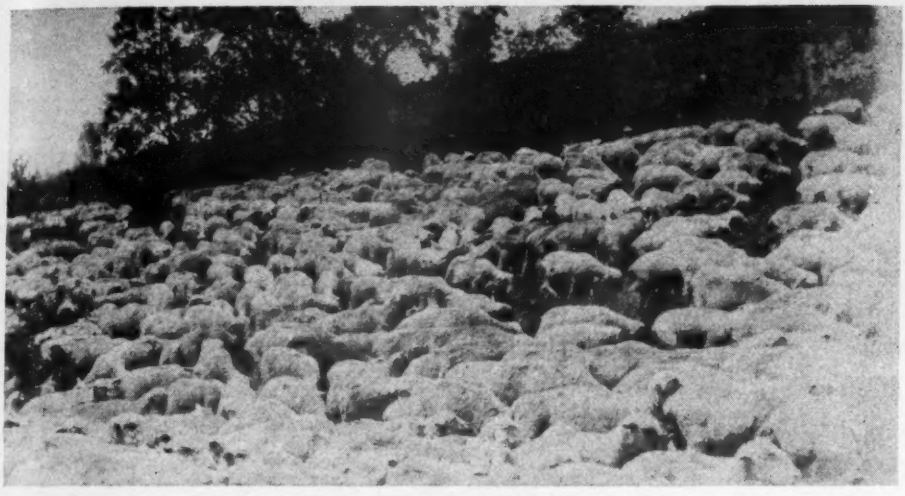
Enteritis Due to Chemical Irritants

There are various chemicals that when fed in excess produce severe gastroenteritis in swine. Probably the most common is oil of chenopodium administered by the owner or swine remedy salesman. In my particular territory we have considerable trouble from a coal tar product used by the gasoline pipe company. This is painted on the pipes when hot and becomes very hard when it cools. In fields through which such pipes pass a certain amount of this material chips off and comes to the surface, where the pigs eat it. It causes a severe gastroenteritis. On post-mortem examination pieces of the material can be found throughout the intestinal tract. Some of my clients, when pasturing these fields, make it a practice to walk the course of the line and pick up this material two or three times a year.

Mineral-starved hogs when given free access to various mineral concoctions often develop a severe gastroenteritis. The same lesions are found when alkaline (lye) solutions that are too concentrated are used to soak the feed.

Enteritis accompanying hog cholera, swine erysipelas, etc., has not been discussed, since in these cases it is merely secondary to the main disease.

War and Wool
The Life of a Western Sheep



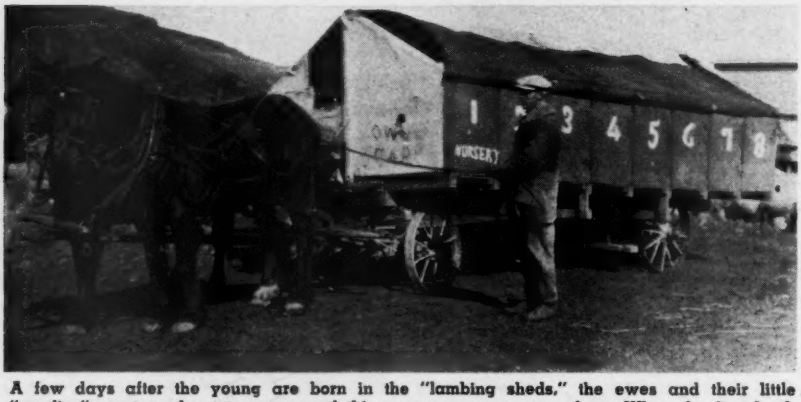
Although the sheep is one of the most peaceable of animals, it plays a vital role in the grim art of war. The wool from 26 sheep is required to outfit one soldier with clothing and bedding. Above is shown a "band" of 1,400 sheep belonging to the Bar-U ranch, along the Snake River in Idaho. This outfit "runs" 12 bands of around 1,500 head each, or some 18,000 sheep

Each band of sheep is under the supervision of a herder and several well-trained dogs. The latter are so intelligent they can do almost everything but drink out of a jug. When a wool grower "runs" more than one band of sheep, a "camp tender" looks after the entire outfit

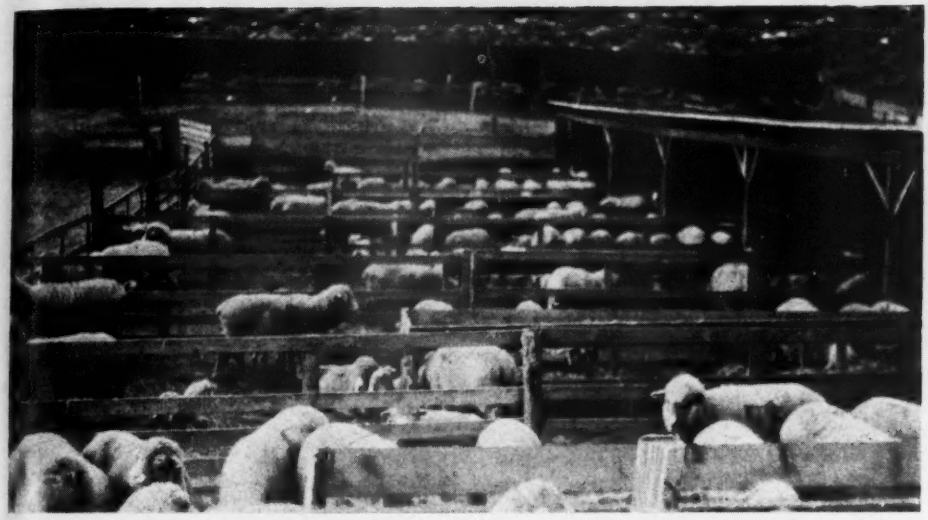
This little orphan lamb is known in Western parlance as a "bum." It will be raised on diluted canned milk and full strength profanity

Lambing sheds on a typical Wyoming sheep ranch, not far from Yellowstone National Park. Here, in this high and dry altitude, are produced some of the finest Cotswold and Corriedale sheep in the country. While the temperature drops to far below zero, there is little snow, and the weather is ideal for the production of long, well-developed wool fibers

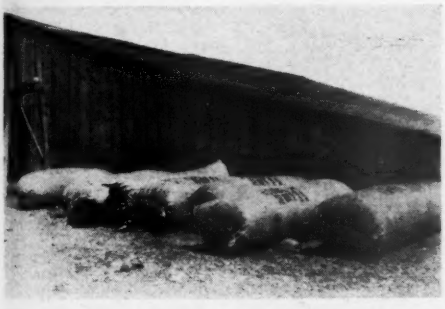
To keep the ewes from straying too far while the lambs are very young, this little lamb corral is made, and the herder sees the young are allowed to suckle their mothers at regular intervals. About 100 ewes will, on the average, produce around 120 lambs



A few days after the young are born in the "lambing sheds," the ewes and their little "woolies" are turned out to graze, and this nursery wagon goes along. When the first lamb "plays out," it is placed in compartment No. 1, and its mother is marked 1, with red or blue chalk. This continues throughout the day, when the nursery may be full of lambs suffering from "spring fever." At the end of the day, they can easily be united with their mothers. Otherwise, this would be a difficult task in a bleating "mob" of thousands



During the winter, various state associations of sheep men have made arrangements with the sheep shearer's union, and the shearers travel in small groups, on pre-arranged schedules, beginning at the Mexican border in January. Everything is run with military precision, for taking care of millions of sheep requires a system of this sort. Either hand or power clippers are used. Each man can handle around 150 animals per day, and it costs about a dime a head. The goodlooking sheep shown in the goodlooking pens in this illustration are awaiting their turn at the shearers, who are operating in the sheds at the right and in the background

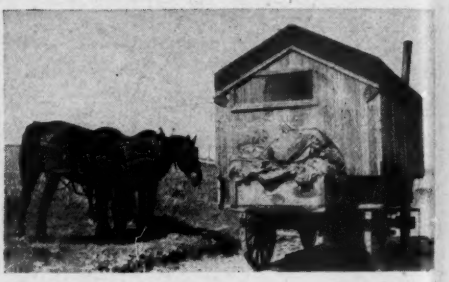


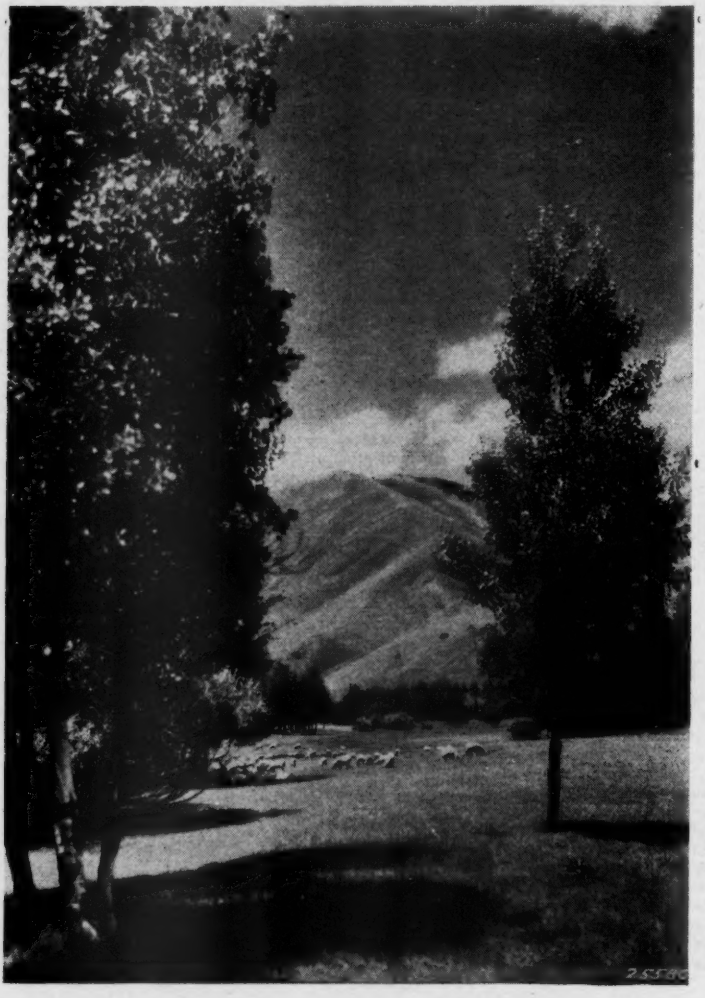
The wool is packed in bags for shipment. Each fleece averages around eight pounds, and our 56,000,000 sheep produce nearly 400,000,000 pounds of wool per year. This is just the amount proposed for civilian use in the United States for 1942 by the Office of Production Management—about half of all wool used in this country during 1941. From another point of view, it represents enough wool to equip an army of 3,000,000 men with warm woolen clothing and bedding. (It requires 12½ pounds of "wool in the grease" to make a four-pound blanket.) The National Wool Growers Association, meeting in Salt Lake City in January, estimated that the nation's supply of apparel wools for 1942 will be 1,138,700,000 pounds, exclusive of imports. The Association has requested the federal government to take over all wool produced in the United States in 1942

Washing dishes on a sheep ranch (below). On a big western sheep ranch over 100 men may be employed, and while expensive china dishes are not in vogue, the "grub" is plentiful and wholesome. Beginning with a light breakfast of fruit, cereal, sour dough hot cakes, ham or bacon and fried eggs, fried potatoes, syrup or honey, and steaming coffee, the men start off to a busy day hauling grain and hay, caring for ewes and their lambs, and many other chores

About the first of June the band is prepared for its trip to the mountains, where it will graze until September. Trailing along the back roads, the sheep make about ten miles a day, and finally reach their allotted part of the forest

Sheep herders "chuck wagon" (below). This horse-drawn vehicle carries all the necessary supplies for the herder during his three-month sojourn in the mountains





The sheep spend the summer on summer range at high altitudes. The owner pays a few cents a head for grazing privileges. In July, the lambs not wanted for next year's breeding are sent back to some large packing house for slaughter, or to a middle west "feeder" for finishing, thus furnishing the finest lamb chops in the world.

The summer range is often in such a remote section that even the camp tender with his little pickup truck cannot reach the herder, who must carry all his supplies with him in the horse-drawn "chuck wagon" shown above. A small portable radio helps to keep him in touch with the outside world.

The scene at the left is in the Sawtooth Mountains near Sun Valley, Idaho—a splendid sheep country

In September, the sheep are trailed down from their summer range in the mountains, and turned in on the grain stubble fields (foggle to the Scots) of the farming sections. Here, they graze and fatten for a few weeks. This does good for both parties, inasmuch as it furnishes cheap feed for the sheep man and helps to eradicate many weed seed for the farmer. A small fee is paid the latter for the privilege of pasturing on the fields

Several black lambs are found in almost every band. They are useful as a means of counting and identifying animals. For example, if a couple of bands become mixed, they can be more easily separated and counted by means of these black sheep

When October arrives, the sheep are trailed back to the home ranch, where they spend the winter. This scene shows part of 14,000 animals eating their Christmas dinner of alfalfa hay in a dry "coulee" along the Snake River in Idaho. Only a few miles distant, but at a much higher altitude, the snow is three feet deep. Thus passes the year in the lifetime of a western sheep, which is old and "broken-mouthed" by the time it is seven

A "Delousing Leg Band" for Chickens

By C. M. HAMILTON, Puyallup, Washington
Department of Veterinary Science
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DURING the summer of 1941 there appeared in this locality a type of medicated leg band which was claimed to kill and repel lice and mites on chickens. The band was similar to the ordinary numbered metal leg band except that a chemical pack was attached to it. At roosting and nesting time the bird's body heat was supposed to cause fumes to escape from the pack, permeate the feathers and kill or repel the lice or mites. The chemicals in the pack were claimed to remain active for several months. The formula given on the container was as follows:

Active ingredients:
- Nicotine sulphate 14.4%
- Naphthalene 21.0%
- Oil of Tar.....12.0%

Inactive ingredients 52.6%

A pen of S. C. White Leghorn hens in one of the Station houses had been observed to be infested with the ordinary body louse, *Menopon biseriatum*. Before treatment, 174 of the 175 hens in the house were found to harbor lice. Twenty-four hens from another house, which were free of lice, were added to the group at the time the medicated bands were applied, to make a total of 199 hens treated. Each bird was examined and scored for degrees of lice infestation before banding and at weekly intervals for four weeks after banding with the "delousing leg bands." The appliances were in two tightly closed containers which were opened only when the bands were removed for use. Table I shows the results obtained from the use of the "delousing leg bands" on hens infested with lice.

Table II shows the effect of the "delousing leg bands" in repelling lice when used on hens free of this parasite but housed with infested hens.

During this trial there was a range in temperature of 43° to 90° F., with an average mean temperature of 62 F°.

TABLE I.—THE DELOUSING EFFECT OF THE MEDICATED LEG BANDS

Degrees of lice infestation	Before banding		1 Week after banding		2 Weeks after banding		3 Weeks after banding		4 Weeks after banding	
	No.	%	No.	%	No.	%	No.	%	No.	%
Slight	37	21.2	34	19.5	10	5.8	11	6.5	2	1.2
Medium	87	50.0	88	50.5	98	57.6	51	30.3	20	12.2
Heavy	50	28.7	52	29.8	62	36.4	106	63.0	142	86.2
Number of Chickens	174		174		170		168		164	

TABLE II.—THE REPELLING EFFECT OF THE MEDICATED LEG BANDS

Degrees of lice infestation	Before banding		1 Week after banding		2 Weeks after banding		3 Weeks after banding		4 Weeks after banding	
	No.	%	No.	%	No.	%	No.	%	No.	%
Slight	0	0.0	18	72.0	8	32.0	4	16.0	1	4.0
Medium	0	0.0	7	28.0	17	68.0	10	40.0	2	8.0
Heavy	0	0.0	0	0.0	0	0.0	11	44.0	22	88.0
Number of Chickens	25		25		25		25		25	

During this trial there was a range in temperature of 43° to 90° F., with an average mean temperature of 62 F°.

Summary

A medicated leg band which was claimed to kill and repel lice and mites was used in a pen of chickens in which 174 were infested and 25 were non-infested with lice at the time of banding. Observations at weekly intervals for four weeks after the application of the bands showed the lice to have increased in number on the hens which had lice before treatment. Hens free of lice, banded with the medicated appliances, and placed in contact with lice-infested hens became heavily infested with the parasite.

Canine Leptospirosis: Its Etiology and Diagnosis*

By H. L. MOSER
Pontiac, Illinois

WITHIN the past few years leptospirosis in dogs has been reported with increasing frequency in the United States, indicating that the disease either has previously escaped recognition or is rapidly increasing in prevalence. Because of the similarity of symptoms of this disease and of canine distemper, blacktongue and piroplasmosis, as well as other diseases, the diagnosis is difficult; and it may well be that the incidence of leptospirosis is much greater than the current domestic literature would lead us to believe. This disease is reported to be of great importance in Europe in both dogs and humans. For example, in the Netherlands between 1924 and 1938, 852 cases were reported among human patients. In Great Britain between 1933 and 1939, 246 authentic cases of human leptospiral infection were reported. Seventy-three cases of leptospiral infection in persons in North America that seem authentic are tabulated at the present time.

Leptospiral infection may be considered as an occupational hazard, provided the occupation exposes the patient to rats or dogs, or to moist material contaminated by the urine of either of these animals.

Etiology

Two types of the leptospiral organism which differ markedly as to their systemic predilection or type of morbid anatomy induced have been isolated from infected dogs: *Leptospira icterohaemorrhagiae,* which produces a generalized icterus, has been identified as the etiological agent of Weil's disease or, as more commonly referred to, infectious jaundice or the "yellows"; and *Leptospira canicola,* which produces a hemorrhagic gastroenteritis and in which icterus is not a pronounced feature, but in which hemorrhagic lesions of varied severity and variable distribution predominate.

The icteric type is reported as more commonly occurring in young dogs, while the hemorrhagic type more frequently attacks the older members of the canine population.

The Leptospira organism is a long closely-spiraled, cylindrical-looking microbe with pointed ends. The length varies from six to nine microns and the width from 0.25 to 0.3 microns. It has motility by either an active rotation or serpentine motion. Staining of this organism by ordinary methods is unsuitable, but fair results may be obtained with Giemsa stain under a dark-field examination.

Symptoms

In the early stages of the disease the symptoms are not very typical or easily recognized. However, in the advanced stages they can be read quite easily.

In both the icteric and hemorrhagic types of leptospirosis the initial symptoms are, with a few notable exceptions, practically identical.

* Presented at the 60th annual meeting of the Illinois State Veterinary Medical Association, Springfield, January 22-23, 1942.

In the icteric type, a generalized icterus is present which is absent in the hemorrhagic type. The onset of the illness with both strains is sudden. The temperature in the icteric type is usually around 103° to 105° F., while the temperature may be increased, normal or subnormal in the hemorrhagic type. In both types a malaise is generally observed, in which there may be lameness or an unsteady gait. This is especially marked in the hemorrhagic type of leptospirosis. Listlessness, vomiting, anorexia, dyspnea, muscular tremors, and marked thirst have been observed in affected dogs.

At first there may be a constipation followed by a fetid diarrhea which is at times blood tinged. Marked ocular and nasal discharge of a greenish purulent character is frequently seen, causing the clinician to confuse this disease with canine distemper. If an involvement of the respiratory tract is encountered there may be a hacking cough and, further, the buccal mucosa will at times show hemorrhagic to yellowish necrotic areas. A fetor is usually present, which is said to be characteristic of this infection. The urine is dark yellow in color and albuminuria is almost a constant finding. Convulsions and coma are seen in the latter stages.

The course of the disease is usually rapid, and the dogs frequently die in 3 to 10 days following the appearance of the first symptoms. It has been reported that recovery is more frequent in young dogs.

Diagnosis

A careful study of the history and of the objective symptoms will guide the clinician to a tentative diagnosis and direct the subsequent laboratory examinations.

A definite diagnosis may be sought through any one of the following tests or a combination of them.

1. Dark-field examination of a specimen of urine; in the early stages of the disease the organism is also demonstrable in the blood by this method.
2. Inoculation of guinea pigs with citrated blood.
3. Agglutination test, using as antigen a suspension of the leptospiral organism with blood serum from the affected dog.
4. A microscopic agglutination and lysis test, using a known culture of the leptospiral organism and serum from the affected animal.

The last two tests have been reported as satisfactorily used but, as yet, are not in common use as diagnostic procedures.

If an animal suspected of having leptospirosis succumbs, the liver and kidneys should be removed and a dark-field examination undertaken of the tissue exudate. At the same time guinea pigs should be inoculated with macerated portions of these organs. The *L. icterohaemorrhagiae* is highly pathogenic for guinea pigs. They usually die between the eighth and fifteenth day after inoculation. When the *L. canicola* strain is involved not more than 40 to 50% of the guinea pigs may be expected to die on the initial transmission. It becomes necessary to enhance the virulence of this strain by repeated passages in order to obtain a higher mortality. This is done by sacrificing the animals surviving at the end of a 10 to 14 day test period and removing the liver and kidneys. Macerated portions of these organs are then inoculated into other guinea pigs. At times it is necessary to make three or four passages before success is attained in isolating the *L. canicola*.

The best results have been obtained by either scarification or intraperitoneal inoculations. Young guinea pigs are superior to older ones in yielding early successful isolations.

The Noguchi-Wenyon or Verwoort's media can be used to isolate and maintain cultures of leptospira. However, frequent subculturing and periodic passage through guinea pigs is usually necessary to maintain the culture.

Differential Diagnosis

The differential diagnosis of the disease is very important, as it is many times confused with distemper and other canine diseases.

In making a differential diagnosis between canine leptospirosis and distemper there should not be a great deal of difficulty encountered when the *L. icterohaemorrhagiae* strain is the causative agent, because of the generalized icterus usually seen. However, when the jaundice is absent, as is commonly the case in infections

caused by *L. canicola*, in contrast with its high frequency in cases caused by the former, the history and symptoms must be carefully and thoroughly considered, since some symptoms of lesser prominence may be helpful in making a tentative diagnosis. In leptospirosis the duration of the illness is relatively short. Dogs affected with the disease develop the symptoms described above, drop into deep coma or clonic-tonic convulsions and die in from 3 to 10 days.

In distemper the following may be observed: The onset is usually slow and the course is more prolonged and, further, it does not commonly affect dogs more than 18 months of age. The repulsive odor peculiar to leptospirosis and ulceration of the buccal cavity are absent in distemper. In the prodromal stage the temperature may recede and then rise or it may continue without remission at a high level throughout the course of the disease. The respiratory tract is more severely affected in distemper; however, occasional cases of leptospirosis may show respiratory involvement. Canine distemper responds to treatment with anti-canine distemper serum; leptospirosis does not.

This disease may be confused with blacktongue, from which it may be differentiated by its rapid course, sudden and persistent vomiting, with blood or bile-stained vomitus, profound depression yielding early to coma and further, by the absence of any significant temperature elevation.

When the acute form of piroplasmosis of the canine species is encountered the differentiation between it and *L. icterohaemorrhagiae* infection is difficult. The outstanding symptom of *Piroplasma canis* infection is anemia with hematuria, in which the urine varies in color from a pale red to a reddish-brown. In the sub-acute form this symptom is less pronounced, and an acute anemia is evidenced by the mucous membranes becoming pale, colorless or bluish. Furthermore, severe vomiting is often encountered in the early stages of piroplasmosis. There is an absence of the characteristic repulsive odor of leptospirosis and of the purulent discharge from the eyes and nose as well as ulcerations of the buccal mucosa. The microscopic demonstration of *Piroplasma canis* in the blood stream is the only possible method of making a definite diagnosis of piroplasmosis.

Leptospirosis has been reported more frequently in the past few years than heretofore. There is a possibility, since the symptoms of this disease and canine distemper, blacktongue and others are similar to that of leptospirosis, that the latter disease may not be recognized in every case. In America leptospirosis is primarily a disease of dogs; but in Europe it occurs among both persons and dogs. In the Netherlands, during the 14 years preceding 1938, there were 852 human cases reported. It is also prevalent in other countries of Europe. It occurs more often where the victim has been exposed to rats or dogs or the excreta of these animals.

Infectious gastroenteritis of dogs, which may be caused by various members of the Salmonella, or colon group, or streptococci, may be confused with an infection by leptospira. Bacterial gastroenteritis may occur sporadically, secondary to dietary disorders or as a contagious disease, spreading rapidly through a kennel. In bacterial gastroenteritis a severe diarrhea without the presence of marked blood-tinged stools is more commonly observed. There is weakness, but not the paralysis in the posterior extremities, convulsions or coma seen in leptospirosis. There is ordinarily no lung involvement and the course of the disease is prolonged from 8 to 12 days. Bacterial gastroenteritis usually responds to symptomatic treatment involving sanitation, diet and such biological and medicinal treatment as appears indicated on the basis of laboratory and clinical findings.

Transmissibility

Mode of Infection.—Leptospiral infection is considered to be possible through the intact skin and mucous membranes as well as through breaks in these tissues due to injury. Usually it follows contact of the abraded or sodden skin with infected mud or water, but it may follow the inhalation of water or the bites of rats, dogs or ferrets. One patient who was found to have a latent leptospiral infection said that he had been bitten by rats on several occasions during the 18 years that he had lived on a city dump. Four other persons who were severely bitten by rats gave no evidence of a leptospiral infection. White rats may become carriers of Leptospira organisms and have been responsible for human infections. One instance has been mentioned in which infection resulted from stepping with an abraded foot on the blood of a rat that had just been killed. Mechanical transmission of the infection has occurred, as illustrated by a case resulting from the bite of a dog that had previously killed a rat and by two other cases following the bites of ferrets that had had contact with rats. In another instance the macerated tissue of a rat that had been caught in a dairy machine was spattered in the face of the patient. Occasionally, association of human cases with infected dogs has been reported. Contact with a jaundiced pig has been mentioned. One case attributed to coitus has been recorded and another considered to be probable in the American series. It has been suspected that contact with tissues in post-mortem examinations has been responsible for several cases. A number of laboratory infections have been known; among them two are included in the American series.

The vast majority of human leptospiral infections have originated from water or moist objects contaminated with infected urine. In most countries it has been shown that the kidneys of about 20% of the wild rats are infected with Leptospira organisms. Infected dogs also have been recognized as chronic shedders of pathogenic Leptospira organisms.

According to Welcker, in Europe about 40 to 50% of apparently healthy wild rats are vectors of spirochetes, so that direct contact with rat urine is apt to be dangerous, as Leptospira organisms are able to penetrate intact skin. He further states that tests showed that 21 of 48 dogs with various diseases gave serological reactions for leptospirosis, and many dogs probably continually excrete these organisms. For this reason, in outbreaks of leptospirosis all rats should be exterminated, as it is highly probable that they are also carriers of the diseases in the United States. Rats are known to be carriers of *L. icterohaemorrhagiae*, but no rats infected with *L. canicola* have yet been found.

The *L. canicola* may be transmitted from one dog to another through intimate contact with the external genital organs in "getting acquainted." Coitus must also be considered as a means of transferring the disease.

Treatment

According to the literature, there are biological products on the market in Europe which are reported to be of some value. In Europe leptospira vaccine (canine) has been found to give dogs a high degree of immunity to the icterohaemorrhagic strain. Anti-leptospira serum canine has been reported as giving complete protection to dogs against heavy experimental infection with *L. icterohaemorrhagiae*. It has also been used therapeutically with varying results. In the United States the results with these products have been unsatisfactory. It is possible that a vaccine and a hyperimmune serum made from both types of leptospira might be of value in the prevention and treatment of this disease. In many instances it is difficult to differentiate between the symptoms of the two types of the disease in the early stages. With products designed for both types more gratifying results may be expected.

Many drugs have been tried empirically, but none appear to be beneficial in the treatment of this malady. Even though the leptospiral organisms are members of the *Spirochaetaceae* family they do not respond to arsenicals and other drugs which are effective against the spirochetes.

Hydro-ureter and Hydronephrosis in a Hog

Occasionally one observes anatomical anomalies which are described in literature but are infrequently seen in the field. Such is the condition reported herein.

A call was received to attend a sick 200-pound barrow, which upon arrival at the farm was found dead. Before necropsy was undertaken the remainder of the herd was examined, but no other sick animals could be detected. The history of the dead hog, according to the owner, was that for approximately two days prior to death the animal had shown partial anorexia and adipsia, general listlessness, but no impairment of ability to move about.

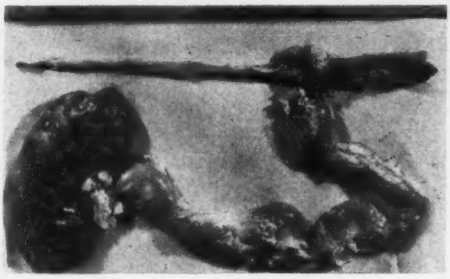
On necropsy the only lesion of pathological significance found was an enlargement of the right kidney and ureter. Search for a possible obstruction in the urinary tract failed to reveal any abnormal condition.

The left kidney appeared normal in every respect. The right kidney and right and left ureters were removed for further examination. This kidney was a dark reddish-gray color and measured 7.5cm by 9cm. There were no external evidences of inflammation. An opening was made and the fluid removed from the kidney and ureter. When tested with the urinometer, this fluid was found to be of the same specific gravity as normal hog urine. Microscopic examination of the fluid revealed only a few desquamated epithelial cells.

Upon opening the kidney there were found multilocular pale gray cysts which had coalesced to such an extent that they had almost completely displaced the normal kidney substance. They varied in size, the largest measuring approximately 3.5cm (1 2/5 inches) in diameter.

The ureter leading from this affected kidney was greatly enlarged, measuring 3cm in diameter. When opened it disclosed multiple sagittal folds thrown up and extending 2 or 3mm (⅛ inch) out into the lumen of the ureter itself.

A tentative diagnosis of hydronephrosis was made and the right kidney, right ureter and left ureter were sent to the laboratory of the Department of Pathology, Duke University, for further examination. At the laboratory sections of the kidney were examined microscopically. The degree of autolysis was such that it was impossible to ascertain accurately the extent of degeneration due to the disease process. There was found to be a distinct dilatation of the pelvis with resultant compression of the renal parenchyma. The cytological evidence pointed to pressure degeneration, but this was difficult to differentiate from actual autolysis. No conspicuous evidence of pyelonephritis was seen, but a few scars were found with evidence of cellular infiltration focally.



The right kidney, right ureter, and left (apparently normal) ureter as taken from the carcass

The laboratory report stated that although the cytological findings, especially within the tubules, could not be correlated with actual disease process, there was evidence enough to give a definite diagnosis of hydro-ureter and hydronephrosis.

Although the entire picture was essentially one of obstruction, examination of the urinary tract failed to reveal any such hindrance to the flow of urine.

Hutyra, Marek and Manninger[1] state that this condition is found frequently in abattoirs. Joss,[2] however, states that during the fiscal year ending June 30, 1941, only 101 hogs were condemned for hydronephrosis in federally inspected abattoirs. Considering the large number of hogs (about 49 million) slaughtered in such abattoirs during the year, this represents an extremely small percentage of the total.

C. EDWIN HOFMANN

Nashville, N. C.

[1] Hutyra, Marek and Manninger, 1938. *Pathology and Therapeutics of the Diseases of Domestic Animals*, Vol. III, p. 50.

[2] Joss, E. C., Chief, Meat Inspection Division, Bureau of Animal Industry.

The Use of N-Butyl Chloride Intracecally for Trichuriasis

For the removal of whipworms, B. A. I. investigators rate the efficiency of n-butyl chloride administered *per os* at 60% at a dosage of 6cc per five pounds of body weight (approximately one ounce, or fifteen 2cc capsules, for a 25-pound dog). This is about twice the dosage recommended by the pharmaceutical laboratories for the treatment of whipworms.

Administering the anthelmintic by mouth is a nasty job with many dogs; and then, always provided the dog does not vomit, one may expect only 60% efficiency.

Out of 11 cases treated by me with the oral dosage formerly advised (15cc for 20- to 40-pound dogs), not one was subsequently found negative on microscopic fecal examination.

The intracecal use of the drug, however, has proved to be very effective. I use a bulb syringe and about one ounce of n-butyl chloride for a 20-pound dog. One treatment is usually all that is necessary, and it is easily carried out on even the most vicious animals.

My method is to strap the dog on the operating table the first thing in the morning after it has had bowel evacuation. I then insert the straight, stiff, hard rubber tube into the rectum as far as possible without force, manipulating it through the belly wall with the left hand while the right hand is engaged in gently inserting the tube farther until it meets resistance. No force is employed at any time. A little practice soon enables one to tell how far the tube can be inserted.

The table is then inclined at an angle of about 60° so that the dog's hind parts are elevated. The bulb of the syringe is squeezed and kept so until the tube is withdrawn. The animal is kept in the inclined position for about five minutes, then liberated.

I always have an assistant or the owner hold his arm around the dog's neck and shoulders to pat and comfort him and to take some of the weight off the hind leg straps. This does much to reduce struggling on the part of the patient.

In my experience, the intracecal method is the only effective way of removing whipworms.

FRIEDRICH G. STEINBACH.
Wildwood Crest, N. J.

* * * *

Obstruction in the Stomach of a Dog

January 9, 1942, a female smooth-haired fox terrier, four months of age and weighing 11 pounds, was brought into the veterinary clinic of Kansas State College. Severe fits had been occurring for the past two weeks. She showed a temperature of 102° F. with respiration 24 per minute and the mucous membranes were a normal pink. A fecal examination showed ascaridiasis. A dose of 0.5cc of tetrachlorethylene and magnesium sulphate was given orally. After treatment the dog was apparently in good health for a week.

January 16th, she developed abdominal pains and fits, at which times the animal would lie on her side and make digging movements with her legs.

January 19th, the owner asked euthanasia for the dog. This was accomplished by giving the animal 20cc of magnesium sulphate intracardially.

The post-mortem findings were interesting in that they disclosed a piece of pork rind 6½ inches long, 1½ inches wide, and ⅛ inch thick coiled into a compact ball at the pylorus. This caused a partial closure at the junction between the duodenum and the pyloric portion of the stomach. The elastic composition of the rind had allowed some passage of partially digested food, but the gastritis produced had caused the nervous disturbances and the acute abdominal pains.

Foreign bodies such as rubber balls, rubber bands, etc., are fairly commonly found in the stomach and intestines of dogs. Due to the elasticity of these articles it is difficult to make a positive diagnosis.

The owner did not care to have the dog treated; hence gastrolavage was not undertaken. Had this treatment been given the condition might have been corrected.

LES EDRINGTON, K. S. C. '42
Manhattan, Kans.

Recurrent Calculus in a Cat

A little over seven years ago "Sunny Boy," a blue Persian male cat, was presented at the Stewart Veterinary Hospital at Colorado Springs, Colo., with a history of anorexia and straining as though trying to urinate. Examination revealed a distended bladder. Since the urine could not be expelled by placing slight pressure on the abdomen, a catheter was passed. Several small calculi were loosened and worked out of the urethra in this manner. After introducing a little mild antiseptic ointment (lanolin and pyoktanin blue) to soothe the irritation, the animal was dismissed.

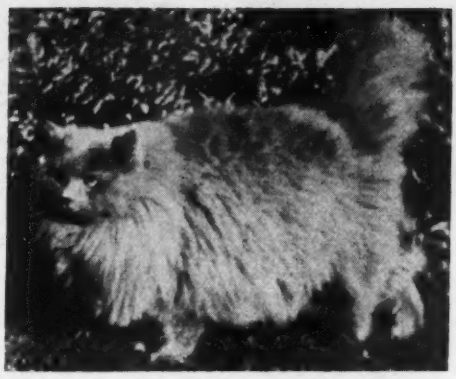
In about four months, however, it was returned with the same trouble. The same treatment as before was given. Several calls of the same nature followed until on one occasion a catheter would not remove the obstruction. A urethrostomy was performed about a year after the initial illness.

The skin was incised at the point where the urethra emerges over the ischial arch. The opening was continued into the urethra, and with the aid of a probe, the calculi were removed. The incision was kept open by anointing the edges of the wound with petrolatum and removing mucus and fibrin which collected.

Six months after the urethrostomy the cat was castrated, with the hope that the condition might thus be improved, for calculi continued to form.

Urinary disinfectants, in the form of elixir of triticoll (*Triticum repens*) 4 grains, and oxocoll (oxyquinoline dihydrochloride) 1 grain, were given *per os* over prolonged periods extending up to three months. In addition, an attempt was made to balance the vitamin intake. On the theory that excessive lime salts in the water supply might be partly responsible for the trouble, distilled water was the only kind offered the patient for over six months. The condition persisted, however, and "Sunny Boy" continued to be a chronic caller.

When I observed the cat on several occasions last summer the general picture was the same. The owner periodically brought in the cat, saying it was "clogged up" again. Each time the calculi were removed with a catheter or probe, large amounts of urine, containing enough blood and mucus to make a thick, dark red fluid, were expelled. Upon evaporation many crystals of calcareous matter were precipitated from the urine.



The blue-blooded, long-haired aristocrats of the cat kingdom seem peculiarly susceptible to the many ills to which feline flesh is heir

At present, a tumorous growth can be palpated in the bladder. This was first detected a year and a half ago. Probably the progressively increasing amount of blood in the urine is a result of this growth.

During the Christmas holidays I again had an opportunity to observe the cat. A relatively large amount of bloody urine mixed with mucus and some calcareous material was removed at this time, and the tumor seemed larger.

During all of these seven years of mitigating treatment "Sunny Boy" has remained in good flesh, has had a healthy, glossy appearance, and seemingly enjoys a normal life.

ORVAL MEINECKE, K.S.C. '42.
Manhattan, Kans.

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From Beaconsfield, England comes the report of a calculus in the bladder of a male kitten eight weeks old. In this most unusual case the carcass weighed two pounds; the bladder walls were one-fourth inch thick, the interior being practically filled by the calculus, a hard, pitted cube almost one-half inch in diameter and weighing five grains.

Autobiography of a Veterinary Practitioner

By E. T. BAKER, Moscow, Idaho

III.

Learning a Trade and Giving It Up

IT has always been a custom in our family for each boy or girl to learn a trade or some useful occupation. As soon as I had finished academy, which corresponds to the present day high school, my folks decided Benjamin Franklin's art of printing might be suitable for me.

Accordingly, I was apprenticed to serve three years in the office of *The Sentinel*, one of the two weekly newspapers in our county seat. The editor was a white-haired gentleman of the old school, very courtly in appearance. He was an attorney, a vestryman in the Episcopal church, and had always been a great friend of my grandfather's. He was an admirer of wealth and social position, and regarded men like Andrew Carnegie, Henry C. Frick and Andrew Mellon as the noblest works of God. He used to get three thousand miles of free passage on the railroad per year, and one of my first trips on a railroad was taken as a gift from him. He was a kindly old soul, and a good man in his day. However, "back in the shop," things were radically different, for the foreman and journeyman printers had very little respect for anything, except, perhaps, the Stars and Stripes.

Tramp printers dropped in on us from time to time, and were always warmly welcomed. This was largely due to their wide acquaintanceship; they brought all the latest gossip of the craft. These men were among the most broadly educated people I have ever met, for they had been everywhere, and seemed to know about everything. I remember well the afternoon the news came in from Buffalo where President McKinley had just been assassinated. An old printer had just "blew in" from that city the day before, and could tell us all about the World's Fair, and the exact location of the tragedy.

In those days, when starting in to learn the trade, each "devil" or apprentice was sent on a wild goose chase, and I was no exception. The first afternoon I was given a sack containing some heavy objects, which I was informed were printer's squares, and told to return them to the *Free Press* office, where they had been borrowed. Away I trudged, carrying the heavy burden. When I arrived at my destination, the "force" gathered around me, and congratulated me upon entering the trade. Taking the sack into a back room, they soon returned with it, and asked me if I would take back some type they had borrowed from our office. The foreman, in a confidential tone of voice, advised me to slip down the alley, as the cops were looking for a fellow about my size and build who had just escaped from the insane asylum. He thanked me heartily for bringing the "squares" back, and soon I was homeward bound. I related how kind and cordial the boys had been to me up at the *Free Press* office, but when the foreman opened the sack, he showed me half a dozen large bricks. Strange as it may seem,

the entire "force" of the *Free Press* barged in about that time, and they all laughed loud and hearty, informing me I was "stuck for the drinks." With many a wise crack at my expense, we all adjourned to the nearest saloon, where my initiation was duly celebrated "on me." However, I took the joke good-naturedly and was taken into the "chapel" in due and ancient form. The next year I had the pleasure of helping "break in" a new apprentice, who was just as green and gullible as I had been.

My first literary spasm occurred when the "Old Man" sent me out to cover a fire, in which a local hen house had been completely obliterated. I produced several pages of gripping narrative about this rural catastrophe. When I turned in my thrilling epic, he carefully read it and smiled. With his trusty blue pencil, he marked out all but the first paragraph.

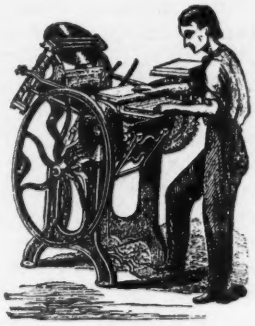
"All people want to know is merely, when, where and what happened. Learn to use short, crisp sentences, and write just like you would describe it to a friend. Don't use big words. Just be natural. This is just a five-line local."

That was some 40 years ago, and I have never received better advice in regard to writing. The hardest thing I find after years of practice is to use good English. When one talks to rural clients year after year, he uses understandable language, with more or less colloquial slang.

Working in a newspaper office soon takes all the conceit out of one's system, for every word and paragraph is criticized very frankly. One soon learns to take this in the constructive way it is intended, and to improve thereby.

In the last year of my apprenticeship, I went to night college, where I took a complete business course, taught by a competent but irascible little Irishman. While I have forgotten most of my shorthand, I can still operate a typewriter much faster than writing in long-hand, and this has always been of the greatest benefit to me. Another thing, I quickly learned the value of a good picture, and I have dabbled in amateur photography ever since.

Becoming a reporter after finishing my apprenticeship, I was quickly disillusioned about the sanctity of religion. As related before, I had been brought up in a very religious atmosphere, and believed in it



implicitly. One of my first experiences taught me that not all is gold that glitters. A leading minister had started a series of sermons to reform the city. In his very first sermon he had flayed the press for its shameless advertisements of quack remedies and liquor. His greatest mistake, however, was in calling reporters "low characters."

About this time one of "the boys" unearthed the interesting fact that the leading elder in this preacher's congregation was receiving $500 a month rental fees from a "madame" who conducted a very questionable establishment. When this was brought to the reverend gentleman's attention, the series of reform sermons suddenly ceased, and he devoted all his efforts to explaining what the Apostle Paul had said to the Ephesians.

I am not condemning the church for things like that. Every lodge, club and organization contains its quota of hypocrites who bring more or less discredit to the entire group. I am merely mentioning this to point out how a country boy began to lose faith in many of the things he had been taught to reverence. It is much like the child who learns about Santa Claus.

I think the younger one learns this painful lesson, the better. Youth is the time to receive these gentle caresses from old Mother Experience, for youth is a pliable and resilient age.

When I entered veterinary practice, one

of my best clients, or so I thought, was a horse dealer who handled many stallions. He was a typical trader of the old school, so crooked he could peacefully sleep on a cork screw. One day, after he had run a bill of a hundred dollars, I gently mentioned the fact that a little money would be acceptable. With a slap on my back, he handed me a twenty, and assured me I was the best "vetinary" he had ever seen. He kept calling me as frequently as ever, and later on slipped me another twenty, which was all I ever received on a two-hundred-dollar bill. Then I thought of Franklin's story about the little boy turning the grindstone, and now when a deadbeat client slaps me on the back, I do not rush to his place at more than sixty miles an hour. In fact, I am often too busy to go at all.

Soon after I learned the printer's trade, the linotype was introduced, and the entire craft entered into a new phase. The old tramp printers passed into the same limbo as the livery stable of 30 years ago. I saw the transition, but was not affected, for the change in my own scheme of things just at that time was as great.

In company with some young fellows who were always into something, I had taken a civil service examination in Pittsburgh. We had tossed five dollars each into "the pot," and the one making the highest grade was to take it. To my great surprise, my grade of over 90% took the money. Shortly after this, a telegram came from the Department of Agriculture, asking if I would accept a position in the Bureau of Animal Industry in Iowa. I attribute my high grade not to scholarship but to neat penmanship, careful paragraphing, good spelling and concise sentences. My paper probably appealed to some examiner.

Had it not been for the lure of the west, and my being footloose and fancy free, I might not have accepted the position. As it was, I packed my three-dollar suit-case, and set out on my journey to unknown lands, for I had never been west of Pittsburgh.

I was assigned to look after the books and various reports by the inspector-in-charge, who proved to be a very fine fellow. It was an entirely new world to me, and I enjoyed it immensely. I made friends easily, for I was young and interested in people, and would listen to their troubles by the hour. A trite definition for everyone to keep in mind is:

"A bore is a person who spends all his time talking about himself, thus keeping you from talking all the time about yourself."

It was here I began taking an interest in veterinary medicine as a career. I had never given any thought to going to college, for I had been too busy in the newspaper game and playing summer semi-professional baseball even to consider it. Also, in those days, few boys went to college, for most of them entered the trades or drifted through life working as day laborers. This was before the "machine age," and man power was supreme.

Another thing, most of the "vetinaries" I had met before were not of a very high caliber. There were few graduates, and most of the "docs" had been self-anointed in some livery stable, and conducted themselves as such. Many of these eminent gentlemen devoted most of their efforts to keeping the distilleries working overtime, while others imagined their card-playing ability was above the average. A few tried to emulate the Sultan of Turkey in maintaining a harem, and spent their money as fast as they made it. I had come from an industrial section where livestock was a distinctly minor business in which few veterinarians were needed. In those days, the old-time practitioner scorned to look at a dog and it even grated on his professional pride to "doctor" a cow. Hogs and sheep were utterly ignored. "Hosses" took his entire attention, and skill in diagnosing lameness, handling colics or "firing" was highly appreciated by the stable experts.

Here, in the middle west, although the profession was young, livestock production was a major industry, and the veterinarian was an important personage. He was a different type from what I had seen, and quite prosperous, as a rule. In those days—1904—farms were entirely powered by horses, and fine ones at that. During the spring season,

the average country practitioner worked almost day and night, for it took him long to make a call over the muddy or snowy dirt roads with a team and buggy. These were also the halcyon days of the empiric, and one or more could be found in every small town or cross roads. When I first went out to Iowa and saw a farmer galloping his team of sweating horses towards the packing house with a load of hogs, everyone knew he had "cholery." Every now and then this disease broke out in the yards, and the entire crew was called out to start "killin' " at any hour of the day or night.

After two years in Iowa, I was transferred to Fort Worth, Texas. Here again I met a splendid group of veterinarians. As I look back over my youth, it seems I was always meeting good men who went out of their way to be kind and helpful to me. Another thing, as I look back over those days, I can see the value of being kept busy and interested in work. Perhaps this fact, and my love for baseball, kept me out of more mischief than any sterling qualities I possessed. When I see a group of high school boys loitering around some "joint" where every cent they can wheedle out of their parents goes into a slot machine or for "cokes," I do not blame them so much as the system that allows them the time to waste. I would say that is the secret of success of the Boy Scouts and Camp Fire Girls organizations—"keep the kids busy."

I had now fully decided to enter some veterinary college, as I had saved up nearly five hundred dollars, and I felt that with that amount, and my knowledge of a good trade, I could complete the course. The choice of a school had been puzzling me, but one morning I happened to read in the morning paper that Dr. W. O. Thompson, president of Ohio State University, was in town on business. Calling him up at his hotel, I made an appointment with him. Never in my whole life had I met such a kindly and magnetic type of man. When I explained my mission, he ignored several other engagements to explain the situation very completely. His entire life was full of similar incidents. Only a few years ago, when he came out to deliver the baccalaureate sermon at the University of Idaho, he walked down to my home, and stayed until after midnight, talking over the years that had gone. "Prexy" was truly a wonderful man, and a college president *par excellence*.

A self-anointed "doc" dismissing a client who had questioned his diagnosis. It will be noted that his operating gown consisted of a horseshoer's leather apron, shortened for convenience

(To be continued)

Book Reviews

Introduction to Parasitology, with Special Reference to the Parasites of Man. *By Asa C. Chandler,* Professor of Biology, Rice Institute. Cloth bound; 711 pages, 309 illustrations. John Wiley and Sons, New York, 1940. $5.00.

This volume, now in its sixth edition, has been the most popular textbook in human parasitology for more than 20 years. In this edition the scope of the book has been widened, and references have been made throughout the text to important parasites of domestic animals in order to give a broader background of knowledge, and to make the book more useful as an introduction to a course in veterinary parasitology. The veterinarian will find much concerning parasites that is of general interest to him, as well as very thorough accounts of all the parasites of animals transmissible to man, and briefer references to all other of the more important parasites of domestic animals. After two introductory chapters the text is divided into three parts, dealing with protozoa, helminths and arthropods, respectively. Thrown in for good measure in the section on protozoa is a chapter on spirochetes and a section on Rickettsiae and arthropod-borne viruses. In the arthropod section disease vectors — mosquitoes, flies, fleas, lice, bugs, ticks, etc.,—are dealt with as well as the purely parasitic forms.

The book is written in an unusually readable, frequently entertaining, manner. The numerous illustrations, including many of parasites of domestic animals, add to its usefulness. Outlines of classification and keys to some of the arthropod groups are given in small type. Each of the 27 chapters is followed by a short bibliography, sufficient to give an entrée to the literature of the subject.—*J. G. H.*

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Air Raid Precautions for the Veterinarian. This timely little booklet, in reality air raid precautions for animals, compiled by Robert F. Wilson, president of the Southeastern Michigan Veterinary Medical Association and distributed by the Detroit Veterinary Instrument and Supply Co., Detroit, Mich., will be supplied to any veterinarian free on request. Get it.

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The Eater's Digest. *By Asa C. Chandler.* Cloth bound; 343 pages, illustrated. Farrar and Rinehart, New York, 1941.

Authoritative, scrupulously accurate, yet written in a highly entertaining manner, this volume is one that almost everyone can read with profit. There are numerous references to the nutrition of dogs, cats, chickens, cattle, etc., although the work is primarily concerned with human nutrition. It deals with types of food, digestion, vitamins (six chapters), minerals, acidosis, water and salt balances, girth control, reducing diets, diet during pregnancy and lactation, laxation (the great American hobby), nervous indigestion, allergies, bellyaches, food preservation, "ptomaine poisoning," food-borne diseases, parasites, aphrodisiacs, skin foods, etc. It ends with a "Dictionary of Diets." The text is illustrated by a series of clever cartoons.—*J. G. H.*

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Useful Bulletins

Report of the Chief of the Bureau of Dairy Industry, 1941. *O. E. Reed.* 51 pp. Price 10c.

Diseases and Parasites of Poultry. *Hubert Bunyea* and *E. E. Wehr,* Bureau of Animal Industry, 82 pp., illus. (F. B. 1652F., rev.) Price 15c.

Horse-Breeding Suggestions for Farmers. *By S. R. Speelman,* Animal Husbandry Division. Pp. 21, figs. 10. (F.B.803, rev.) Price 5c.

Swine Production in Michigan. *V. A. Freeman.* Extension Bul. No. 234. A popular discussion of the feeding, care, housing and management of swine. (48 pp., 3 tables, 21 figs.)

The National Poultry Improvement Plan. Miscellaneous publication 300 (revised). By specialists of the Bureau of Animal Industry, in cooperation with poultry leaders, poultry breeders, and members of the breeder and commercial hatchery industry. Pp. 28. Price 5c.